THE ASSOCIATION BETWEEN PSYCHOLOGICAL ATTRIBUTES AND ORGANISATIONAL PERFORMANCE IN NEW ZEALAND SMALL TO MEDIUM SIZED ENTERPRISES

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Regards,

Matthew John Craig Walley

The Association between Psychological Attributes and Organisational Performance in New Zealand Small to Medium Sized Organisations

Abstract

This thesis reports on the association between particular psychological attributes of owner/operators and organisational financial performance in New Zealand small to medium sized enterprises (SME's). The specific psychological attributes of interest are ambiguity tolerance, self efficacy, resilience and planning orientation. A direct response mail survey was sent to 4,500 New Zealand organisations fitting the criteria for this study. Ambiguity tolerance, self efficacy and resilience were assessed using established item scales from the literature. Planning orientation was assessed using planning scenario analysis. Data analysis was conducted using structural equation modeling. Results show that the planning orientation of owner/operators has a significant direct association with organisational financial performance. Ambiguity tolerance, self efficacy and resilience were found to have a significant indirect association with financial performance. The findings of this research have implications for both theory and practice. Theoretically there are implications for cognitive and personality psychology, organisational theory and behaviour, entrepreneurship and research related to the psychological attributes of interest in this thesis. Practically, the results provide managers with a meaningful tool to aid in the selection, training and management of individuals responsible for strategic decision making in SME and other organisational settings.

Key Words: Ambiguity tolerance, self efficacy, resilience, planning, small to medium sized enterprises, entrepreneurship, organisational performance, decision making, mental models.

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Chapter One

- Introduction

1.0 Introduction

In this chapter, I present an overview of this thesis. (1) I present a background to my research to enable framing of the research problem. (2) The research problem and hypothesis will be presented. (3) This will be supported by a justification for this research explaining the theoretical and practical importance of this thesis. (4) The methodology will be briefly explained and validated. (5) An overall summary of the contents of the thesis and the limitations of the research will be given.

1.0.1 Background to the research

Research focused on the improvement or understanding of organisational performance has investigated a wide variety of factors in an attempt to understand what influences performance (Capon, Farley and Hoenig, 1990). Performance has also been defined with an equally wide scope. For instance, it can be defined financially, or in terms of staff satisfaction, staff turnover, public perception, technological growth and so on. A variety of measures have been used as predictors of performance. Examples include organisational structure, location, technological systems, staff training, management experience and so on. There is also a wide scope of variety in respect to the research methodologies applied and the domains of research; for example small versus large organisations, not for profit organisations, cross cultural comparisons and so on.

This thesis focuses on small to medium sized organisations (SME's) as these are the most prevalent in the New Zealand business environment (Statistics New Zealand, 2006). In New Zealand, SME's are the dominant forms of organisation with 96.4% of the approximately 350,000 business operating in New Zealand employing under 20 full time equivalent staff members (Statistics New Zealand, 2006). SME's account for the employment of approximately 1.6 million individuals from a total working population of approximately 3.2 million (Statistics New Zealand, 2006), signifying the importance of SME's to majority of the New Zealand population. As a consequence understanding factors which may contribute to either success or failure of SME's is of great importance to the New Zealand business and community in general. In New Zealand, this importance is widely acknowledged throughout the business and government community

with a number of trade enterprises, government grants and support networks set up to foster growth of SME's in New Zealand. In fact, this research has been funded through the Tertiary Education Commission in New Zealand due to its focus on SME's.

Given that owner/operators play a crucial role in the management of these SME's (Perren, Berry and Partridge, 1998; Miller and Toulouse, 1986; Ritchie and Brindley, 2000), I was curious to find out if the psychological attributes of the owner/operator had any influence on the performance of the organisation. The idea of investigating the relationship between psychological attributes and organisational performance is certainly not new or novel. There are a number of studies and articles which have reported mixed success in finding significant relationships between psychological attributes and organisational performance (Dörner and Schaub, 1994; Judge, Thoresen, Pucik and Welbourne, 1999; Rigas and Elg, 1997; Westerberg, Singh and Häckner, 1997, Wood and Bandura, 1989). Most attributes are drawn from the Big Five Personality Inventory (Goldberg, 1993). I was mainly interested in the problem solving ability of the owner-operator and its influence on firm performance. In this thesis, I have operationalised problem solving ability in terms of four psychological attributes: (a) ambiguity tolerance, (b) self efficacy, (c) resilience, and (d) planning orientation. In chapter two, I discuss in detail the rationale for selecting these attributes.

The variety of research domains that have been investigated in the literature is also greatly varied and this is often where gaps in the literature appear. For example, some variables and their relationship to performance have only been investigated in large organisations operating in the North America or in specific industries operating in limited geographic regions. Clearly the findings from these studies cannot be reliably applied to New Zealand organisations.

When selecting the psychological attributes for this thesis, four criteria were used; (1) intuitive link to problem solving ability and performance, (2) established and reliable scales (alpha > 0.7), (3) prima facie validity and (4) some established research linking the attribute to problem solving ability or business performance. Based on these criteria the

four attributes of ambiguity tolerance (AT), self efficacy (SE), resilience (RES) and planning orientation (PO) were selected. The justification for their selection is discussed in more detail in chapters two and three.

As a measure of organisational performance, I decided to focus solely on financial measures. This was decided as the majority of SME's operate with the goal to make a profit and, in most cases, grow the organisation. Factors such as staff training, education, organisational structure, staff satisfaction and so on, while relevant in some settings, would be very hard to measure and it is unlikely that most SME operators would have any quantitative data on these measures. The selection of performance measures is further detailed in chapter three.

1.0.2 Research problem and hypothesis

The primary research problem of this thesis is as follows:

"Do the psychological attributes of ambiguity tolerance, self efficacy, resilience and planning orientation of owner/operators influence the financial performance of small to medium sized New Zealand organisations?"

I start with the hypothesis that these attributes do positively influence organisational performance in New Zealand SME's. This is due to the large influence that owner/operators exert over organisational decision making processes in SME's. In essence the organisation thinks, behaves and makes decisions in the same style as the owner/operator. Specific hypothesis related to each psychological attribute are listed below. These hypotheses relate to both relationships between the attributes and organisational performance and co-variation relationships between the attributes. These are developed and explained in detail in chapter two of this thesis.

> H^{1AT}: *The ambiguity tolerance of the key organisational decision maker will be directly positively associated with firm financial performance.*

H^{2AT}: The ambiguity tolerance of the key organisational decision maker will be indirectly positively associated with firm financial performance.

H^{3AT}: The ambiguity tolerance of the key organisational decision maker will be positively associated with self efficacy.

H^{1SE}: The self efficacy of the key organisational decision maker will be directly positively associated with firm financial performance.

H^{2SE}: The self efficacy of the key organisational decision maker will be indirectly positively associated with firm financial performance.

H^{3SE}: The self efficacy of the key organisational decision maker will be positively associated with resilience.

H^{4SE}: The self efficacy of the key organisational decision maker will be positively associated with a preferable planning orientation.

H^{1RES}: The resilience of the key organisational decision maker will be directly positively associated with firm financial performance.

H^{2RES}: The resilience of the key organisational decision maker will be indirectly positively associated with firm financial performance.

H^{3RES}: The resilience of the key organisational decision maker will be positively associated with ambiguity tolerance.

H^{1PO}: The complexity and specificity of planning of organisational decision makers will be positively associated with firm financial performance.

H^{2PO}: The depth and width of planning of organisational decision makers will be positively associated with firm financial performance.

H^{3PO}: Increased planning certainty by organisational decision makers will be negatively associated with firm financial performance.

H^{4PO}: Increased control in planning by organisational decision makers will be positively associated with firm financial performance.

H^{5PO}: Increased simultaneity in planning by organisational decision makers will be positively associated with firm financial performance.

1.0.3 Justification for the research

Understanding factors which influence organisational performance has been of interest to researchers in a variety of fields such as organisational theory, organisational behaviour, organisational and applied psychology, economics and management science. Research in this field has been driven by a number of factors; for example, understanding performance, attempting to predict success, isolating factors of success or explaining failure. Regardless of reason, there is no doubting the popularity of this domain of research.

Research specifically related to understanding the relationship between psychological attributes and performance in a variety of settings is also well addressed in the literature. For example, significant relationships have been established between various psychological attributes and health, management ability, sporting ability, personal well-being, and business performance (Dörner and Schaub, 1994; Judge, Thoresen, Pucik and Welbourne, 1999; Rigas and Elg, 1997; Westerberg, Singh and Häckner, 1997, Wood and Bandura, 1989). Specific to this thesis is the relationship between the attributes of AT, SE, RES and PO and organisational financial performance in SME's in New Zealand.

While the stream of research related to the relationship between psychological attributes and business performance is well developed in the literature, there are a number of gaps which exist. I discuss these in detail in chapter two. To date there has been limited research dedicated to, or in consideration of, the New Zealand business environment, with most studies being focused on North American or Western European countries. Research between psychological attributes and performance is also somewhat limited on an international stage in the area of SME's, with the majority of studies

focusing on larger organisations or sub-units of these organisations. Often these studies are more concerned with the relationship between attributes and personal performance, not general organisational performance. This research aims to address some of these gaps by focusing on SME's in a New Zealand context. There are other gaps specific to each psychological attribute which are discussed in detail in chapter two.

Finally, this research can be justified by the implications of any potential findings. This thesis is primarily concerned with understanding whether particular attributes influence the financial performance of SME's in New Zealand. The New Zealand economy is dependent on the operation and success of SME's for general economic growth and stability. Any findings which could potentially assist in increasing the performance of SME's have clear implications for the general business community and economy. The attributes of interest in this thesis are also able to be easily identified and coached or developed in individuals. This could allow training programs or assistance to be given to organisational owner/operators to improve the manner in which they make decisions and, in turn, improve their organisations' performance. These implications are discussed in detail in chapter five.

1.0.4 Methodology

This study applies a deductive research design to investigate the effects particular psychological attributes of senior organisational decision-makers have over organisational performance in SME's. The psychological attributes of interest are AT, SE, RES and PO. A deductive design was appropriate given the high level of development and understanding of the independent variables in the existing literature (Cavana, Delahaye and Sekaran, 2001).

A quantitative research design was employed. This primary design was delivered through the use of a mail-based survey comprising of select response item scales, an open-ended scenario response and a series of closed questions relating to organisational performance. A mail survey was used due to the scale based nature of the questions

which could not easily be administered via telephone. Also a number of SME operators do not actively use a computer so internet administration was considered inappropriate.

In my research, I have used Structural Equation Modeling (SEM) to unravel the relationships between psychological attributes of AT, SES, RES and PO and firm performance. The use of structural equation modeling (SEM) in the field organisational research is relatively new. The majority of studies to date that focus on identifying factors for success in organisations tend to adopt either multiple regression or factor analysis as first order statistical techniques. This is particularly common in studies which have focused on the relationship between attributes and performance. SEM as a technique is very popular in psychology literature and presents a number of distinct advantages in this type of research over traditional first-order statistical techniques. These justifications are briefly discussed in the following section of this chapter and detailed in chapter three.

There are four main advantages identified in the literature for using SEM in contrast to path or regression analysis when analysing survey data with latent constructs (Byrne, 2001; Schumacker and Lomax, 2004): (1) SEM allows the researcher to test of the contribution of individual observed variables to each latent construct (Byrne, 2001), (2) SEM better acknowledges the presence of measurement error when statistically analysing data (Schumacker and Lomax, 2004); (3) SEM allows for observed variables to be 'grouped' into latent variables, instead of modeling singularly (Bandalos, 2002; Hall, Snell and Foust, 1999; Wright, 2006); and (4) SEM places an emphasis on model fit and allows the researcher to modify their hypothesised model to improve fit with the data (Byrne, 2001), this flexibility in modeling is suited to the exploratory analysis applied in chapter four. In contrast, path and regression analysis focus solely on the significance of the relationships between the variables providing minimal scope for model refinement (Schumacker and Lomax, 2004).

1.0.5 Outline of the report

This thesis consists of five chapters. The first chapter provides an introduction and brief overview of the contents and direction of this research. The thesis is justified, research question and hypotheses stated, research boundaries defined and the scope of the findings established.

The second chapter provides a comprehensive review of the literature related to the four key psychological attributes of AT, SE, RES and PO. This includes (1) each attribute being defined within the context of this thesis and based around earlier definitions of the concepts, (2) a discussion of the constructs relationship to general performance and specifically organisational performance, (3) identification of the individual manifestations of each attribute and (4) discussion on how they are believed to affect behaviour and decision making ability.

The third chapter provides a comprehensive review of the research methodology: (1) The design and selection of the study instrument and how individual attribute scales are grounded in existing literature is justified, (2) the unit of analysis is specifically defined to frame the population of interest, (3) a detailed chronology is presented of how and when the survey instruments were administered, (4) any limitations in the methodology are identified and rationalised, (5) the coding process of the dependent measures is detailed and (6) the structural equation modeling techniques selected for data analysis are detailed and justified.

The fourth chapter presents the empirical results of this thesis. This includes (1) an overview of the research measure and analysis techniques used, (2) a summary of the descriptive statistics and correlations between the variables, (3) presentation and evaluation of the final structural equation model, (4) a discussion regarding its development and (5) conclusions related to the research hypotheses are presented.

The final chapter of this thesis presents the conclusions and implications of the results identified in chapter four; (1) conclusions related to the research are presented, (2)

insights into general research problem based around the findings of chapter four, (3) implications for theory and practice are identified, and (4) future research directions are identified.

1.0.6 Limitations of scope

There are a number of limitations related to this thesis. These are related to both the methodology and the primary research question. In respect to the research question, this thesis is primarily interested in SME's operating in the New Zealand business climate. The sampling techniques therefore reflect this interest and findings should be applied with caution outside of the New Zealand or the SME context. Second, this research is focused solely on financial performance with performance measured in terms of profit, staff and revenue growth over a four-year period. Clearly this is only one way to define organisational performance and other organisations which do not exhibit high financial growth could be successful in respect to other equally valid measures. Third, certain organisational types were not surveyed. This group comprised of not-for-profit, government, public service, legal firms, accountants, organisations that were not registered as a company, trading trust or partnership. These organisations were not surveyed as they are not representative of the population of interest. Specific discussions regarding the methodological limitations of this thesis are detailed in chapter three. This includes a thorough discussion and justification of the unit of analysis and its limitations.

Chapter Two

- Literature Review

2.0 Literature Review

In this chapter, I will review the literature related to the four independent variables used in my study. The variables of ambiguity tolerance (AT), self efficacy (SE), resilience (RES) and planning orientation (PO) are all discussed in separate subsections. These subsections discuss; (1) why the concept is important to organisational decision making, (2) the definition of the variable, (3) important antecedents or sub-elements of the variable, (4) the emergence and development of the variable, (5) research relating the variable to organisational processes, (6) manifestations of the variable at an individual level and (7) any reported inter-relationships between the independent variables. Each subsection concludes by proposing hypothesis related to the variable of interest. The final section of the chapter presents hypothesised models based around these hypotheses.

2.0.1 Overview of key constructs

The construct of AT stems from the disciplines of cognitive and personality psychology. Disciplines of decision making, stress and coping, and health psychology have made extensive use of the construct. The popularity of the concept has also led to the development of ambiguity theory as a specific area of study. Immediate domains of relevance to this thesis, which have considered AT in an organisational setting, include change management, decision making, problem solving and entrepreneurship.

The construct of SE emerged from the discipline of personality psychology. Over time it has been adopted by cognitive, behavioural and developmental psychology researchers. A wide variety of domains have made use of the SE construct. The relevant domains to this thesis include educational psychology, organisational behaviour, and decision making psychology. Developed directly from Wood and Bandura's (1989) research, social cognitive theory has gradually developed to be an independent discipline in respect to SE. This thesis focuses largely on the findings of social cognitive theory and the immediate research disciplines of organisational behaviour and decision making psychology to formulate its hypothesis in relation to SE.

RES is a dispositional construct that has only recently gained significant interest in the literature. Early RES research was firmly grounded in studies related to both developmental and behavioural psychology, with immediate interests centered on health and psychological recovery and child developmental psychology. Recent research has investigated the effect of RES over organisational decision making processes, but this body of literature is still largely conceptual and emergent. The literature review for this thesis is largely based on the themes and findings from developmental and behavioural psychology.

PO is an emergent concept that has not been extensively researched in the literature. As such there are no immediate disciplines of relevance. This thesis has drawn on literature from the research settings of strategic organisational planning, cognitive and decision making psychology, and planning theory. Each sub-element of PO was also relevant to more immediate research disciplines, which are discussed in detail in section ***2.4.3*** of this chapter. Hypothesis in relation to PO have been formulated based around the general strategic planning literature and decision making psychology.

It is important to state one caveat before progressing with this chapter. This relates to the potential cause and effect relationship between the psychological attributes and SME performance. Some entrepreneurship literature argues that the operation of an SME encourages the development of certain levels of psychological attributes. Therefore are positive psychological traits therefore the reason for entrepreneurial success or the result of it? It is outside of the scope of this thesis to challenge this question. All owner/operators who took part in this research had been operating their organisation for a period of four years or greater and there was high variation in the various psychological attributes. If the operation of a SME was precursor to certain typologies of psychological attributes then lower variation in these measures would surely be expected. Although as discussed in the results section of this thesis it is apparent that there is no direct relationship between constructs. As the relationship found in the final structural model is only of a moderating fashion, no cause and effect relationship is proposed between the attributes of AT, SE and RES and SME performance.

2.1 Ambiguity Tolerance

In this section, I review the dispositional construct of ambiguity tolerance (AT) and the literature related to ambiguity theory. First, I discuss the emergence and development of ambiguity theory and AT across various research domains. I emphasise the application and importance of AT to individual decision making and problem solving in an organisational context. Second, I compare various definitions of AT and select a specific definition for this thesis. Third, I summarise generic construct profiles from the literature regarding high and low AT dispositions. Fourth, I review the relationship between AT and the other dispositional traits used in this thesis. Fifth, I summarise the gaps in the literature related to AT. Finally, I conclude the chapter by presenting my hypothesis related to the AT construct.

2.1.1 Why is AT important?

Information overload, organisational and environmental complexities, ambiguous tasks and conflicting demands from multiple constituencies are common decision making challenges for present day managers (Lane and Klenke, 2004). Research in the field of ambiguity theory indicates that the ability to tolerate and act on ambiguous cues are central leadership competencies required to cope with these challenges (Banning, 2003). A meta-analysis of ambiguity theory research by Furnham and Ribchester (1995) indicates a significant positive relationship between effective decision making in complex and ambiguous situations and an individual's AT. Furnham and Ribchester (1995) concluded that multiple studies determined differences in AT manifest in the content and form of representations that individuals create in ambiguous situations, the direction of actions they undertake, and the accompanying affects of these actions.

2.1.2 Definition of AT and Ambiguity

Past research has referred to the AT concept as uncertainty tolerance, uncertainty avoidance, ambiguity intolerance and cognitive ambiguity tolerance (Furnham and Ribchester, 1995). While there is no commonly accepted definition of AT (Furnham and Ribchester, 1995; MacDonald, 1970; McLain, 1993), most researchers have based their definition of AT around Frenkel-Brunswik's (1949, 1951) work (Furnham and

Ribchester, 1995). Commonly referenced definitions are by; English and English (1958) who define AT "as a willingness to accept a state of affairs capable of alternative interpretations, or alternative outcomes: e.g. feeling comfortable (or at least not uncomfortable) when faced by complex social issues in which opposed principles are intermingled" (p.24). Budner (1962) defines AT as "the tendency to perceive ambiguous situations as desirable" (p.29). MacDonald (1970) proposed that individuals of high AT, "seek out ambiguity, enjoy ambiguity, and excel in performing ambiguous tasks" (p.791). I have used Budner's definition of AT in this thesis. This definition is the most commonly accepted definition for research investigating the relationship between decision making and AT (Furnham and Ribchester, 1995).

In respect to individuals with a high AT, English and English (1958) propose a definition that focuses on an individual accepting an ambiguous situation. Budner (1962) argues that individuals of high AT did not merely accept ambiguous situations but viewed them as desirable. MacDonald (1970) added that these individuals would also actively seek out and excel in performing ambiguous tasks. English and English's definition could be criticized for viewing high AT as only accepting or coping with an ambiguous situation. This definition is often accepted by research in the domains of health and education. MacDonald's definition is somewhat limiting as certain studies have indicated that individuals with a high AT do not necessarily actively seek ambiguous situations, but have a greater ability to cope with them when they arise (Gupta and Govindarajan, 1984; Lane and Klenke, 2004). Budner's (1962) definition provides a good balance and remains consistent with present research.

The definition of an ambiguous situation is less contentious. Ambiguous situations are generally defined by a lack of sufficient information emerging in under three contexts: (1) "a completely new situation in which there are no familiar cues," (2) "a complex situation in which there are a great number of cues to be taken into account," and (3) "a contradictory situation in which different elements or cues suggest different structures, in short, situations characterized by novelty, complexity, or insolubility" (Budner, 1962, p.30). Norton (1975) elaborated on this definition by isolating eight

categories common to an ambiguous situation. They include; (1) multiple meanings, (2) vagueness and incompleteness, (3) probability (the problem can be analyzed as a function of probability choice), (4) unstructured, (5) lack of information, (6) uncertainty, (7) inconsistencies and contradictions, and (8) unclear. From an organisational perspective, it is reasonable to expect that an individual in a position of strategic decision making authority will encounter situations of this nature on a frequent basis (Dollinger, 1983; Ghosh and Ray, 1997; Lane and Klenke, 2004; Strauss, Connerley, and Ammermann, 2003).

2.1.3 Ambiguity Theory and the Emergence of the AT construct

The relationship between an individual's AT and various personality, behavioural and performance based measures has been of interest since Frenkel-Brunswik's early studies on ambiguity and authoritarian syndrome (1949, 1951). These early studies by Frenkel-Brunswick established AT as a potential "emotional and personality variable" (Furnham and Ribchester, 1995, p.180) and outlined the behavioural dispositions related to AT. These studies argued that AT generalizes to the entire emotional and cognitive functioning of the individual, characterizing cognitive style, belief and attitude systems, interpersonal and social functioning, and problem solving behaviour (Frenkel-Brunswik, 1951). Budner (1962) was the first to develop a valid and reliable scale based measure of AT. Subsequent studies by Rydell and Rosen (1966), MacDonald (1970), Norton (1975), Bhushan and Amal (1986), McLain (1993) and others have focused solely on the development of an effective scale-based measure. The findings of Budner's (1962) research also established the AT concept a cognitive and perceptual process, not just solely a personality trait.

Furnham and Ribchester's (1995) meta-analysis reviewed the body of research related to the AT concept from the period of 1950 though to 1993. They found that most studies examined the relationship between AT and other psychological variables, providing good "concurrent and construct validation of the concept" (Furnham and Ribchester, 1995, p.181). The varieties of studies indicate that AT has been adopted by clinical, cognitive, educational, occupational, personality and social psychologists. AT

has therefore been linked to processes as varied as organisational culture, creativity, authoritarianism and schizophrenia (Furnham and Ribchester, 1995). Examples of recent and central studies in the field have focused on the relationship of AT to leadership competence (Lane and Klenke, 2004), attitudes towards diversity (Strauss, Connerley and Ammermann, 2003), cultural variability (Hofstede, 1984), risk assessment (Einhorn and Hogarth, 1985; Ghosh and Ray, 1992, 1997; Heath and Tversky, 1991, Kahn and Sarin, 1988), decision making (Dollinger, Saxton and Golden, 1995; Ellsberg, 1961), negotiation effectiveness (Ghosh, 1994), entrepreneurial behaviour (Schere, 1982), and the ability to cope with change (Judge, Thoresen, Pucik, and Welbourne, 1999). These studies are complemented by numerous domain specific studies in business, health, psychology and education.

2.1.4 Individual AT Traits

Throughout the literature relating to ambiguity theory and the AT construct, there is a general consensus regarding the differentiation between high and low AT (Furnham and Ribchester, 1995). Consistencies have been documented from cognitive, personality and behavioural perspectives. Individuals with a high AT are considered able to tolerate the feelings of anxiety and uncertainty induced by ambiguity. Their affective reactions are less intense and more varied (Lane and Klenke, 2004). They will interpret an ambiguous situation without denying or distorting parts of its complexity (Feather, 1969). High AT individuals are likely to elaborate more adaptive and better coordinated behaviour (Foxman, 1976). They can withstand the discomfort of the ambiguous situation long enough to accommodate and generate more appropriate and flexible responses to it (Stoycheva, 2000).

Individuals with a low AT perceive and interpret ambiguous situations as a source of psychological discomfort or a threat, seem confused by ambiguity and tend to avoid it (Stoycheva, 2000). When faced with ambiguity, they experience stress, react prematurely and engage in avoidance behaviour (Furnham and Ribchester, 1995). Low AT individuals are likely to arrive at "black-and-white" judgments (Stoycheva, 2000), to reduce their

view of the situation to certain, simple and familiar cues. They defend themselves through rigid, stereotyped behaviours; often leading them to undesirable solutions.

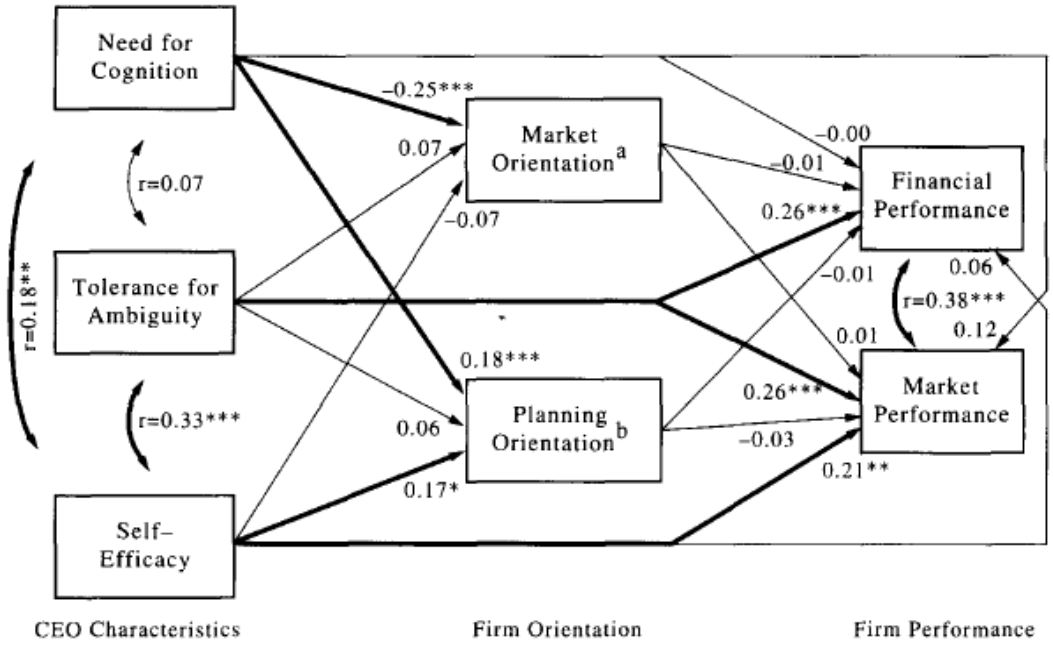
2.1.5 AT in Organisations

Research on the relationship between AT and organisational performance and behaviour has grown since the early 1970's, and can be divided into two primary streams. One stream views AT as an individual cognitive trait that influences organisational behaviour through an individual's interaction within the organisation. The second, less dominant approach, views AT as a property of the organisations' culture (Furnham and Ribchester, 1995). Given this thesis' focus on individual decision making this review will focus on the first stream of research. One of the earliest references to AT in an organisational setting was by Stogdill (1963) who investigated the relationship between AT and leadership decision making behaviour. In 1973, Harlow reported a relationship between AT and promotional preference, concluding that high AT individuals prefer new experiences, challenges and the opportunity of promotion. A meta-analysis of 13 empirical studies by Frone (1990) reviewed the relationship between AT, role stress, and job satisfaction. Frone determined that all studies concluded individuals with high AT showed higher job satisfaction and exhibited fewer signs of job-related stress. Dollinger (1983) conducted a study on AT as a trait of entrepreneurs, hypothesizing that entrepreneurs would be highly tolerant of ambiguity given the turbulent, chaotic and complex world of the entrepreneur. The results of the study confirmed the hypothesis. Another study be Schere (1982) found that entrepreneurs tested low for AT, although some concerns regarding the sampling and lack of a control group have been identified in Schere's study (Furnham and Ribchester, 1995). Gupta and Govindarajan (1984) reported that managers of Fortune 500 companies with high AT were more successful at build or growth-based strategies, and managers with low AT were more successful at harvest or stability-based strategies, concluding that individuals with a high AT are more capable of dealing with the uncertainty and dynamism of growth. Lefebvre and Lefebvre (1992) found that individuals with high AT also seek out ambiguous and uncertain situations and are more willing and able to assume the risk associated with innovation and growth.

The effect of individual AT during times of organisational change, both as a moderating variable and dispositional trait, has been investigated under differing organisational settings. Ashford (1988) found that high AT was positively related to coping with change amongst employees during AT&T's divestiture. Hamilton (1988) concluded that comfort with ambiguity was a characteristic common to organisational development consultants in the US Navy. Rush, Schoel and Barnard (1995) determined that a high AT was an important aspect for coping with change among state government employees in North America. A more recent study by Judge, Thoresen, Pucik and Welbourne (1999) reviewed the relationship of seven dispositional traits (including AT) and coping with change. This study was more comprehensive than previous work in this field with data being collected from 514 organisations located in North America, Europe, Asia and Australia. A composite risk tolerance scale was constructed comprising of AT, openness to experience and low risk aversion scales. A positive correlation of .60 ($p<.01$) between the composite scale and coping with change was found. While the AT concept was not isolated in this research, principal component analysis indicated that AT accounts for 86% of the variation in the risk tolerance composite scale (Judge, Thoresen, Pucik and Welbourne, 1999).

Another study investigated a possible relationship between AT and financial and market performance in small Swedish firms operating in turbulent environments (Westerberg, Singh and Häckner, 1997). This study conceptualized that the AT of the firm CEO directly moderates the market orientation and planning orientation of firm, in turn affecting the firms financial and market performance. The authors argue that the influence of the CEO's psychological characteristics is central to determining the strategic direction and behaviour of the organisation. The results of this study indicated a significant positive relationship ($p<0.01$) between high AT and improved financial and market performance. This relationship was not moderated through planning and market orientation as hypothesized. Figure 1 illustrates the studies path coefficients and correlations. Significant paths and correlations are shown in bold for clarity.

The study concluded that AT was the most vital CEO characteristic in determining firm performance; "The high uncertainty induced by regulatory changes and a turbulent market leaves CEO's with low AT in a difficult situation. Their colleagues with higher AT appear to possess greater resources for coping with the uncertainty, resulting in better performance for their firms" (Westerberg, Singh and Häckner, 1997, p.265). Miller and Toulouse (1986) state that the CEO becomes increasingly more important in small firms, as the CEO may be the only person in a managerial position. Effectively the CEO's and organisations decisions are one of the same (Westerberg, Singh and Häckner, 1997).



*: p<0.1, **: p<0.05, ***: p<0.01
a: This construct is a continuum that ranges from (full) internal orientation to (full) market orientation.
b: This construct is a continuum that ranges from (full) implementation orientation to (full) planning orientation.

Figure 1 (source, Westerberg, Singh and Häckner, 1997, p.262)

Research related to AT in an organisational setting is well developed. The majority of studies have argued a positive relationship between AT and various organisational performance factors. These studies have been well documented and in most cases demonstrate very good levels of statistical rigour. There are however three

predominant limitations in current research. First, there has been no research that has investigated the impact of AT over organisational financial performance by isolating AT as a dispositional trait. Studies to date (for example: Judge, Thoresen, Pucik and Welbourne, 1999) have only included AT as sub-component of composite scale. Second, no study has examined the relationship between AT and organisational performance across multiple industries. Most studies have focused on a singular industry or limited regional locality. Third, no research has studied cross-cultural comparisons of the relationship between AT and organisational financial performance in different cultural populations.

2.1.6 Inter-correlations between AT and Independent Variables

Research in the area of ambiguity theory has acknowledged a strong inter-relationship between AT and other dispositional traits since work by Frenkel-Brunswick (1949) linked AT to authoritarian syndrome. These relationships have been proposed at both a conceptual and empirical level. The traits that AT has been related to are largely determined by the research domain; in the case of this thesis research related to organisational theory will be reviewed. A meta-analysis of the literature determined the most common dispositional traits related to AT in organisational research are; self efficacy, risk aversion, dogmatism, authoritarianism, openness to experience, achievement motivation, need for cognition, learning style and intelligence.

The relationship between AT and self efficacy is of direct relevance to this research. This relationship has been considered at both a conceptual and empirical level. Conceptually, Bandura (2001) has proposed that complex and uncertain situations present a great challenge to individuals with high self efficacy. These situations present the individual with numerous disincentives such as frequent setbacks, and a lack of validation through social comparisons. Bandura (2001) states it is surprising that self efficacy sustains itself under complex and uncertain situations when most of the critical elements to sustaining self efficacy are not present. Audia, Locke and Smith (2000) have gone as far to state that high self efficacy may be counter productive in uncertain situations as individuals are more likely to persist with previously successful strategies

under an unsuitable context. Lane and Klenke (2004) propose that AT acts as a moderator of self efficacy under situations of complexity and uncertainty. They propose that AT "manages self efficacy for ventures into uncertainty, ventures that are not framed by expectations of quick incentives" (Lane and Klenke, p. 75). High AT may therefore allow an individual to reframe their perception and expectations of an uncertain situation; leading to negative stimuli such as failure, confusion and anxiety, commonly associated with uncertain situations, being disassociated from their self-concept (self efficacy). An empirical study by Judge, Thoresen, Pucik and Welbourne (1999) considered seven dispositional traits and their influence over coping with organisational change. Significant inter-correlations were reported between AT and self efficacy, self-esteem, openness to experience, risk aversion and positive affectivity. The results indicated a positive correlation of 0.57 (p<0.05) between AT and self efficacy. These findings are consistent with research by Westerberg, Singh and Häckner (1997) who cited a positive path coefficient of r=0.33 (p<0.01) between AT and self efficacy.

The body of literature has given little attention to the relationship between the other independent variables of this thesis (planning orientation and resilience) and AT. Westerberg, Singh and Häckner (1997) proposed that planning orientation would act as a moderating variable between AT and firm performance. This research defined planning orientation as the presence or absence of a formal strategic plan. In contrast this thesis is interested in the individuals approach to structuring a plan, so the two studies are not directly comparable. However, as shown in figure 1, the relationship between AT and planning orientation was not statistically supported (Westerberg, Singh and Häckner, 1997).

2.1.7 Gaps in the literature

The AT construct is well established with significant research across a broad variety of domains. However, the consideration of AT in an organisational setting is a relatively new development in the literature. There are three predominant limitations in current research. First, there has been no research that has investigated the impact of AT over organisational financial performance by isolating AT as a dispositional trait.

Second, no study has examined the relationship between AT and organisational performance across multiple industries. Of relevance to the other variables in thesis; there has been no investigation of the relationship between AT and PO. A few studies have suggested a likely relationship between AT and planning procedures.

2.1.8 Hypotheses

The general findings in the literature support a positive relationship between the AT of organisational decision makers and organisation performance and behaviour. This relationship may be either direct or indirect and hypotheses are formed for each argument. Studies to date have found that decision makers with high AT have a tendency to (1) thrive in an uncertain, complex and dynamic environment, (2) embrace risk, (3) pursue growth, (4) cope better with organisational change, and (5) feel less stressed and pressured by ambiguous, uncertain and complex situations. As this thesis concerns organisational decision makers responsible for strategic decisions, it is reasonable to assume participants will face complex, uncertain and ambiguous situations on a frequent basis. A high AT is therefore preferable; leading to the following hypotheses:

> *H^{1AT}: The ambiguity tolerance of the key organisational decision maker will be directly positively associated with firm financial performance.*

> *H^{2AT}: The ambiguity tolerance of the key organisational decision maker will be indirectly positively associated with firm financial performance.*

> *H^{3AT}: The ambiguity tolerance of the key organisational decision maker will be positively associated with self efficacy.*

2.2 Self efficacy

This section will review the construct of self efficacy (SE). This involves reviewing both the antecedents and consequences of an individual's SE. First, I will review the conceptual differences of general and specific SE and various definitions of each. From this review I propose an adapted definition of SE for this thesis. Second, I discuss how the four principal antecedents of SE – mastery of experience, modeling,

social persuasion and physiological/emotional states, influence its development. Third, I explain how SE acts to mediate an individual's performance though cognitive, motivational, affective, and selective processes. Fourth, I summarise research related to the effects of SE over individual decision making in an organisational context. Fifth, I present generic profiles of high and low SE individuals. Sixth, I review the relationship between SE and the other dispositional traits used in this thesis. Seventh, I summarise the gaps in the literature related to SE. Finally, I conclude the chapter by presenting my hypothesis related to the SE construct.

2.2.1 Overview

Present day managers are frequently confronted with complex, ambiguous and dynamic problem situations that challenge their decision making abilities (Wood, 1986) and threaten their self-concept (Bandura, 1977). Social cognitive theory suggests that an individual's ability to cope with these threats and challenges is influenced by their SE (Wood and Bandura, 1989). A review of SE literature indicates a general positive relationship between SE and effective decision making in complex and ambiguous problem situations. From an organisational perspective, Stajkovic and Luthans (1998) conducted a meta-analysis (114 studies, n = 21,616) of SE and its relationship to individual work-related performance, finding a general positive relationship between the concepts. These findings are consistent across other domain specific studies in education, health, developmental and behavioural psychology (Bandura, 1997).

2.2.2 Definition of SE

The basic definition of SE is relatively constant throughout the literature. The majority of researchers loosely accept some variation of Bandura's social cognitive definition of SE (Chen, Gully and Eden, 2001). The main debate regarding the definition of SE centers on the generalisability of the construct. Bandura (1982) initially defined SE as "a personal judgment of how well one can execute courses of action required to deal with prospective situations" (p.122), a common later iteration; 'the extent to which an individual believes him or herself capable of successfully performing a specific behaviour' (Bandura, 1986). A refined definition by Wood and Bandura (1989) defines

SE as "beliefs in one's capabilities to mobilize the motivation, cognitive resources, and courses of action needed to meet given situational demands" (p.408). This definition is the most widely referenced for research on SE in an organisational setting (Chen, Gully and Eden, 2001; Stajkovic and Luthans, 1998). This definition is not without criticism. Chen, Gully and Eden (2001) argue the use of 'situational' inherently limits the scope of SE to specific situational contexts; with most SE research being limited to task or state specific SE (SSE), to the detriment of generalized SE (GSE). Chen, Gully and Eden (2001) view SSE as "a relatively malleable, task-specific belief" (p.376), SSE only relates to a specific task or collection of related tasks. In contrast, GSE is defined as an "individual's perception of their ability to perform across a variety of different situations" (Judge, Erez and Bono, 1998, p.170) or "one's belief in one's overall competence to effect requisite performances across a wide variety of achievement situations" (Eden, 2001). GSE is viewed as a "stable, trait-like, generalized competence belief" (Chen, Gully and Eden, 2001, p.376), GSE does not relate to any specific task.

While the GSE concept addresses the generalisability issues of the social cognitive definition of SE (Chen, Gully and Eden, 2001; Ilgen and Pulakos, 1999), it has received some criticism. Bandura (1997) questions the utility for GSE as the construct is not sufficiently divergent from self-esteem (Bandura, 1997; Mischel and Shoda, 1995; Stanley and Murphy, 1997). He argues GSE, like self-esteem, represents an individual's feeling regarding their general capabilities (Bandura, 1997); failing to capture the individual's *judgment* of their *task related* capabilities. A meta-analysis by Judge and Bono (2001) indicates that SE and self-esteem are positively related, but remain distinct constructs (Brockner, 1988; Eden, 2001; Gardner and Pierce, 1998). GSE is seen to "capture a motivational belief (or a judgment) regarding task capabilities, whereas self-esteem captures more of an effective evaluation or (or feeling regarding) the self" (Chen, Gully and Eden, 2004, p.376). GSE represents how an individual *judges* their capabilities; self-esteem represents how an individual *feels* about their capabilities (Betz and Klein, 1996; Chen, Gully and Eden, 2004; Gardner and Pierce, 1998; Kanfer and Heggestad, 1997).

Social cognitive research has also questioned the predictive validity and accuracy of GSE (Bandura, 1997; Cervone, 1997; Locke and Latham, 1990). Studies employing SSE and GSE report better predictive relationships between SSE and outcome measures. Eden (1996, 2001) argues this is due to 'specificity matching'; the SE construct measured must match the specificity or generality of the outcome measure. He proposes the predictive relationship is moderated by the 'match' of the construct and outcome measure. When outcome measures are specific, SSE is a more effective measure of SE (Bandura, 1986, 1997) such as auditing and computer skills. If outcome measures are ambiguous or generalized, GSE is preferable (Eden and Aviram, 1993) such as work-place performance, general problem solving.

In this thesis, SSE is clearly unsuitable as a construct, as the outcome measures (profit, revenue and staff growth) are general measures of organisational performance and not directly related to any task-based SE. The commonly referenced definitions of GSE were somewhat vague and failed to emphasise the motivational and cognitive elements of SE. I have used a combination of Wood and Bandura's (1989) and Judge Erez and Bono's (1998) definitions of SE and GSE. This thesis defines SE as 'an individual's belief in their capabilities to mobilize the motivation, cognitive resources, and courses of action needed to perform across a variety of complex problem solving situations'. The scale measure of SE employed by this thesis is a GSE scale that targets problem solving ability and general motivation. This is discussed in detail in chapter three.

2.2.3 Antecedents of SE

A review of the literature indicates that the antecedents of SE are important in explaining both the development and performance effects of SE. In the case of all antecedents, a bi-directional relationship between the antecedent, SE and performance has been documented in the literature (Bandura, 1997). Given the direct mediating effects of the antecedents over performance, it is prudent to review them in this thesis.

Bandura (1977, 1997) identifies four principal antecedents of SE: (1) mastery of experience, (2) modeling (vicarious experience), (3) social persuasion and (4)

physiological and emotional states. These antecedents are common to both SSE and GSE (Chen, Gully and Eden, 2001). Mastery of experience is the central antecedent for the development of SE. "Performance successes strengthen self-beliefs of capability, failures create self doubts" (Wood and Bandura, 1989, p.364). The strength of this antecedent is moderated by other factors; (1) the individual's preconception of their abilities, (2) the perceived difficulty of the task, (3) the amount of effort expended, (4) the amount of aid received and (5) the way the cognitive experiences are reconstructed in memory (Bandura, 1997). Tasks must be challenging, important, moderately autonomous and require effort from the individual for them to significantly effect long-term SE. "If people experience easy successes, they come to expect quick results and are easily discouraged by failure. To gain a resilient sense of [SE], people must have experience in overcoming obstacles through perseverant effort". (Wood and Bandura, 1989, p.364)

Modeling (vicarious experience) influences SE through a social comparison process. "People partially judge their capabilities in comparison with others. Seeing similar others succeed by sustained effort raises observers' [SE], whereas observing similar others fail despite high effort lowers observers' [SE]" (Wood and Bandura, 1989, p.365). Bandura (1997) explains that while modeling experiences have a much weaker effect on SE than direct ones, under some conditions they can act to minimize the effects of direct experience. For example, observation of frequent failures by similar others, increases failure expectancy and reduces the negative SE implications of direct failure experiences (Brown and Inouye, 1978). The effect of vicarious experience is also moderated by the type of modeling - coping or mastery (Kazdin, 1973). Mastery modeling is present when observed individuals have mastered a process and can perform the task calmly and faultlessly. Coping modeling is present when individuals are unfamiliar with a task and must develop new skills to succeed. Modeling is argued to be more influential when coping strategies are observed. Successes achieved through repeated effort reduce the negative impacts of failure on SE. Failure is seen to be a result of insufficient effort or limited experience, not a lack of ability (Bandura, 1997). Vicarious experiences involving coping modeling decrease the stress and insecurity associated with short-term failure, create persistent effort and improve general SE.

Social persuasion is somewhat limited in its direct influence over SE (Bandura, 1997). Instead, it acts to sustain and reinforce established SE beliefs; enabling people to mobilize greater effort towards achieving a set task, persist despite difficulty or failure and reaffirm faith in one's capabilities (Bandura, 1997). SE is conversely undermined by negative persuasion. The knowledge and credibility of the messenger and the degree of appraisal disparity moderate the persuasory effect on SE (Bandura, 1997). The messenger must be seen to understand the task and capabilities of the persuasion recipient for the message to be considered valid. The degree of appraisal disparity must also be balanced between task difficulty and the known capabilities of the individual. If the degree of disparity is too great, the message is likely to be ignored, undermining the credibility of the messenger. A high degree of disparity can undermine SE as individuals may attempt tasks beyond their present capabilities, leading to a direct experience of failure. To reinforce SE and encourage effort, the persuasion must be given by a credible individual and relate to a task that is reasonably achievable through commitment and *acquirable* capabilities. Pittenger and Heimann (2000) and Popper and Lipshitz (1993) proposed conceptual frameworks to explain the positive influence of effective mentoring and coaching on the SE of entrepreneurs and business leaders. These frameworks are of limited relevance to this research, as they were not empirically tested and focused largely on the motivational aspects of leadership and SE development. The models largely measured leadership effectiveness based around concepts related to organisational culture (staff motivation/morale, group cohesion, stress etc). In contrast this thesis intends to measure organisational outcomes of revenue, profit and staff growth.

Physiological and emotional states are often interpreted as somatic indicators of SE; positive emotions (happiness etc.) are seen to reflect high SE, while negative emotions and physical reactions (depression, increased heart rate etc.) are seen to reflect low SE (Bandura, 1997). These indicators are particularly pertinent when tasks require physical ability or evoke stress reactions. Bandura (1988, 1997) argues that somatic indicators are normally interpreted as a negative stimulus; "people often read their physiological activation in stressful or taxing situations as signs of vulnerability or

dysfunction" (Bandura, 1997, p. 106). This physiological activation induces recall of negative experiences when similar physiological states were present. The emotional stress reaction is then heightened by the recall of negative experiences. These states act together to temporarily lower the SSE of the individual. If negative somatic indicators are repeatedly experienced, the long-term GSE of the individual can be undermined. Construal biases can act to moderate the interpretation of physiological and emotional indicators (Bandura, 1997). Individuals with low SE are likely to have a heightened sensitivity to bodily states of anxiety arousal, interpreting any change as a failure to cope with the task demands. Individuals with high SE commonly interpret stress reactions as preferable, recalling previous situations where they succeeded under stressful circumstances, believing heightened arousal improves general performance. Emotional states can also act to magnify the long-term effect direct experiences have on GSE (Kavanagh and Bower, 1985; Wright and Mischel, 1982); "efficacy beliefs are raised in a positive effect state and lowered in a negative effect state, regardless of whether the mood was induced by success or failure" (Kavanagh, 1983 in Bandura, 1997, p.113). In an earlier study I observed the effect of perceived SE over an individuals' ability to operate a computer-simulated organisation (Walley, 2004). Participants in this study included 20 managers from the Christchurch, New Zealand, business community and 20 business students from the University of Canterbury. The emotional states and attitudes of participants were observed throughout the duration of experiment. It was observed that participants with low SE were, in general, unable to manage feelings of stress and discomfort and attributed these feelings to their lack of ability. Some common observations of low SE participants included: (1) asking for constant reassurance from the researcher, (2) asking for comparative feedback about their performance relative to others, (3) externalizing blame for failure to the simulation or the research, and (4) showing physical signs of stress (complaint of headaches). Participants with high SE described the stress as 'challenging and exciting'. Some common observations of high SE participants included: (1) offering themselves frequent positive feedback, and (2) exhibiting a generally positive demeanor (smiling, clapping and laughing).

2.2.4 Mediating Processes of SE

Bandura (1997) identifies four mediating processes through which SE beliefs manifest their effects: (1) cognitive processes, (2) motivational processes, (3) effective processes and (4) selection processes. This thesis will not review these processes in its entirety, focusing only on effects related to complex problem solving and organisational decision making. Bandura (1997, p.117-161) provides a comprehensive review.

Cognitive processes are the means by which an individual becomes aware of people, objects and situations in the environment and their subjective, symbolic meaning. (Eysenck, 2001). These processes influence how an individual perceives a situation, the cognitive constructions/models they develop and the actions they take (Foster and Kaplan, 2001). Bandura (1997) maintains that SE can act to enhance or undermine the effectiveness of cognitive processes by influencing cognitive construction and inferential thinking. Cognitive construction determines how an individual visualizes the models and predicted outcomes of a situation. Research by Krueger and Dickson (1994) found that SE determines whether individuals perceive an uncertain problem situation to be an opportunity or a threat and whether they model success or failure orientated strategies. The study involved 153 business students taking part in brief decision making task. The subjects were then randomly told whether they were expected to be competent or not for a specific complex problem solving task. Subjects who were led to believe they were more competent perceived more opportunity in risky decisions and exhibited greater SE. The subjects who were led to believe they were not very competent perceived threats and demonstrated risk-aversion (Krueger and Dickson, 1994).

Inferential thinking relates to a series of belief systems that influence an individual's understanding of how actions effect outcomes. These belief systems have been found to directly mediate SE and performance and include: (1) conception of ability, (2) controllability and (3) comparative pattern (Bandura, 1997). Conception of ability concerns whether ability is seen as an inherent or acquirable skill (Nicholls, 1984). When skill is seen to be acquirable, failures are seen as a natural part of the learning process (Dunning, 1995) and an opportunity to expand knowledge and competencies. If seen as

inherent, failures are attributed to deficiencies in intellectual ability and a warning to avoid challenging situations. A study by Wood and Bandura (1989) required participants to manage a computer simulated organisation. One group was told that complex-problem solving skill is acquirable; the other group was told that it is inherent. Figure 2 illustrates the effect conception of ability has over SE, performance goals, effective use of analytic strategies and performance. The far right graph illustrates whether ability is conceived to be acquirable (solid line) or stable (broken line). Across the three trial blocks individuals who perceived ability to be an acquirable entity reported higher SE, self-set more challenging goals, used effective problem solving strategies and achieved a higher level of organisational performance when compared to the subjects who perceived skill to be a stable entity.

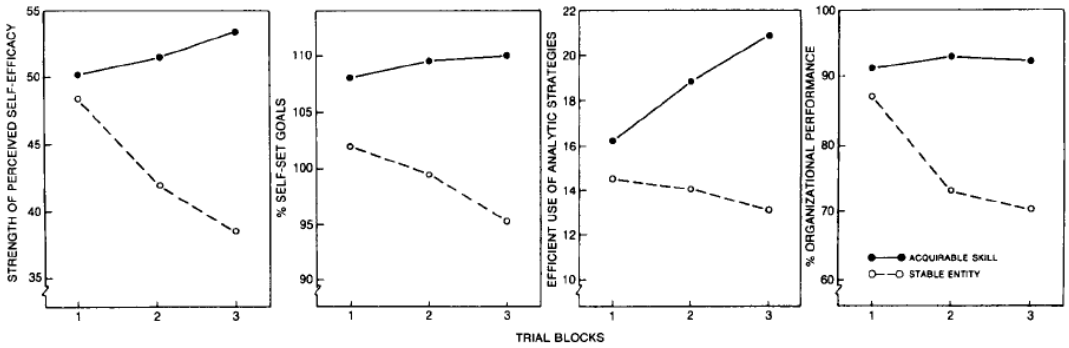


Figure 2 (source, Wood and Bandura, 1989, p.373)

Controllability indicates an individuals' level of perceived environmental control (Bandura, 1997). Research by Bandura and Wood (1989) found SE to be resilient to negative feedback under conditions of high perceived control, as participants believe they can actively improve their current situation. Maintaining high SE then led to more ambitious self-set goals and increased performance. Figure 3 illustrates the effect controllability has over SE, performance goals and performance. The far right graph illustrates whether environmental control is perceived to be high (solid line) or low (broken line). Across the three trial blocks individuals who view environments to be controllable reported higher perceived SE, set themselves more challenging goals and achieved a higher level of organisational performance when compared to the subjects who perceived environments to be relatively uncontrollable.

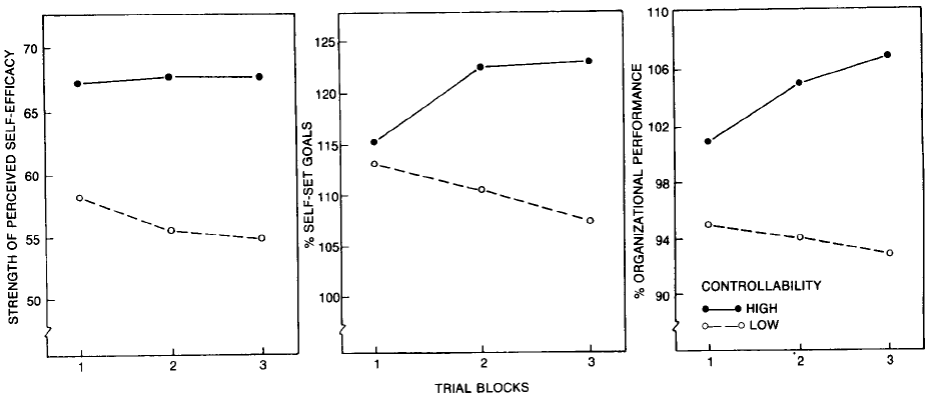


Figure 3 (source, Bandura, 1997, p.121)

Comparative pattern refers to the social comparisons that individuals make relative to others to self-appraise their capabilities (Bandura, 1997). A study by Bandura and Jourden (1991) confirmed the mediatory effect comparative processes have over SE mechanisms and performance outcomes. They established that when an individual *believes* they are progressively mastering a problem relative to others, then SE, use of analytic strategies and performance improve (Bandura and Jourden, 1991). Figure 4 illustrates the effect comparative pattern has over SE, analytic strategies and performance. Comparative pattern is split into two dimensions: (1) how an individual directly compares themselves to others, and (2) whether an individual believes they are improving relative to others. The far right and left graphs illustrate the dimensions of comparative pattern. The first dimension relates to whether an individual views themselves to be similar (broken circle line) or superior (broken triangle line) to others. The second dimension relates to whether the individual believes they are progressively mastering (solid circle line) or declining (broken square line) in the task relative to others. Across the three trial blocks there was minimal effect over organisational performance and the use of appropriate analytic strategies in respect to the first dimension of comparative pattern. There was an initial effect of perceived superiority increasing perceived SE; however this converged with similarity over the three trial blocks. A perception of progressive mastery was found to increase perceived SE, use of appropriate analytic strategies and organisational performance over the trial blocks. In contrast progressive decline adversely effected perceived SE and organisational performance.

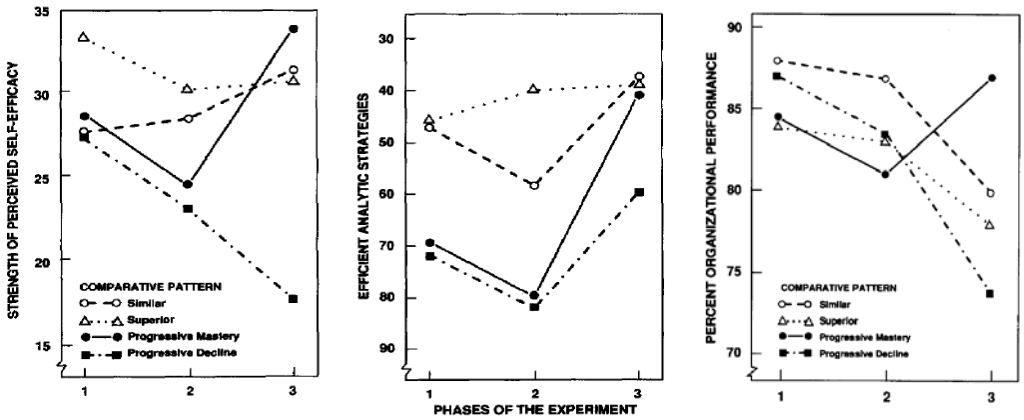


Figure 4 (source, Bandura and Jourden, 1991, p.946-7)

Motivation and goal setting behaviour are accepted as two important constructs in explaining management performance (Vancouver, Thompson and Williams, 2001). Research by Locke and Latham (1990) found that individuals experience higher levels of performance when they are highly motivated and set challenging goals. Bandura (1997) proposes that SE effects performance by mediating self-motivation and purposive action. Three theoretical bodies support and explain this claim; (1) attribution theory, (2) expectancy-value theory and (3) goal theory.

Attribution theory states that individuals retrospectively attribute causal relationships for prior attainments to personal capabilities and perceptions of task demands (Atkinson, 1957). "People who credit their successes to personal capabilities and their failures to insufficient effort will undertake difficult tasks and persist in the face of failure" (Bandura, 1997, p.123). If an individual has high SE, they are more likely to attribute success to personal capability, leading to the selection of more challenging task and goals, further reinforcing SE. If failure is experienced it is attributed to task demands or lack of effort, having minimal effect on SE. Under attribution theory the relationship between SE and motivation/goal setting is bi-directional (Bandura, 1997).

Expectancy-value theory argues that people motivate themselves and guide their actions anticipatorily by the outcomes they expect to flow from given courses of action (Wigfield and Eccles, 1992); the higher the expectancy that certain behaviour can secure

specific outcomes and the more highly those outcomes are valued, the greater the motivation to perform the activity (Atkinson, 1964; Bandura, 1997). This is referred to as incentive-based motivation. Under expectancy-value theory an individual's motivation is dependent on the expected outcome from certain behaviour and belief in their capability to achieve desired outcomes (Bandura, 1997). Bandura (1997) argues that SE directly effects an individual's assessment of their capabilities. If an individual possesses high SE, they will believe in their capability to attain valued outcomes, setting increasingly ambitious goals as their SE develops. Goal theory slightly differs from expectancy-value theory in that motivation is driven by cognized goals and not expected outcomes. Research indicates that SE influences the level at which goals are set, the strength of commitment to achieve them, the strategies used to reach them and the intensification of effort when initial failure is experienced (Bandura, 1997). The relationship between SE and motivation/goal setting under both expectancy-value and goal theory is considered to be bi-directional (Bandura, 1997; Eden, 1988).

Social cognitive theory proposes that SE also moderates effective processes and anxiety arousal under threatening or ambiguous events (Bandura, 1986). If an individual believes they have the capability to exercise control over a threat, they are unlikely to expect failure, and thus minimize anxiety arousal (Bandura, 1997). When a threat is seen to be unmanageable, environments are seen to be dangerous and failures are expected, increasing anxiety arousal. Research indicates that SE regulates the nature and intensity of emotional experiences through thought, action and effect (Bandura, 1997). The SE construct, through these three effects, primarily acts to influence an individual's perceived control over a situation (Bandura and Wood, 1989). When an individual possesses high SE, they are more likely to believe they have the capability to control a situation. This feeling of control minimizes any potential anxiety arousal. The negative implications of anxiety arousal over performance and SE are discussed in section ***2.2.3***.

The mediating processes discussed so far explain how SE acts to enable individuals to create beneficial environments or exercise control over them. The final mediating process relates to the effect SE has over the selection of environments.

Bandura (1997) explains that individuals are frequently confronted with decisions that present varying courses of action with different outcomes and rewards. The selection decision for each course of action is largely governed by the goals, motivation and perceived capabilities of the individual; these constructs are all directly mediated by SE (Bandura, 1997). Research has documented the selective effect of SE in social development (Perry, Perry and Rasmussen, 1986), career choice (Betz and Hackett, 1986) and business strategy (Judge, Thoresen, Pucik and Welbourne, 1999). Bandura (1997) emphasizes the long-term influence SE, through selection processes, can have on the development of an individual; "beliefs of personal efficacy determine choice of associates and activities. Affiliation patterns in turn, shape the direction of efficacy development" (Bandura, 1997, p.161) "thus, seemingly inconsequential efficacy determinants of choices can initiate selective interpersonal associations that produce major and enduring personal changes" (Bandura, 1997, p.160).

2.2.5 SE in Organisations

Research on the influence of SE within an organisational setting can be divided into four perspectives; (1) SE as a determinant of career pursuits and ambitions, (2) as a moderating factor in the mastery of occupational roles, (3) collective organisational efficacy and (4) as a moderator of organisational decision making (Bandura, 1997). Given this thesis' focus on individual decision making at a managerial level, this review will focus on the third research perspective. Under this perspective, the relationship between SE, decision making and organisational performance has been studied using both simulated and actual organisational settings. Simulated research designs are most frequent in the literature (Stajkovic and Luthans, 1998).

Social cognitive theory was the initial cognitive model used to investigate the relationship between SE and organisational decision making (Wood and Bandura, 1989). This research involved participants managing a computer simulated organisation under various experimental conditions. The simulation was designed to simulate the complexity, dynamism and uncertainty of actual managerial decision making. Each experiment manipulated SE through influencing particular mediating factors; (1) conception of

ability, (2) controllability and (3) goal setting. All mediating factors were found to have bidirectional relationship to SE and simulated organisational performance (see earlier discussion in section ***2.2.4***), "these factors influence how well managers cope with organisational demands and how well they learn from failures, setbacks and successes" (Wood and Bandura, 1989, p. 380). The authors concluded that "[SE] influences are important determinants of a managers' analytic thinking and performance accomplishments in complex decision environments" (Wood and Bandura, 1989, p.380). Figure 5 illustrates Wood and Bandura's (1989) path analysis of the causal structures of SE influences on organisational attainments. The initial numbers on the path of influence are the significant standardized path coefficients ($p < .05$); the numbers in parentheses are the first-order correlations (Wood and Bandura, 1989, p.379).

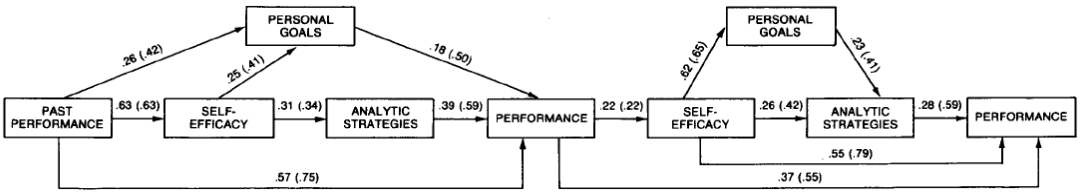


Figure 5 (source, Wood and Bandura, 1989, p.379)

Subsequent simulated studies by Bandura and Jourden (1991), Bandura and Wood (1989), Wood, Bandura and Bailey (1990) and Wood and Locke (1990) confirmed and elaborated the claims of social cognitive theory. These studies generally found that as SE decreases, individuals become more erratic in their decision making, lower organisational and personal aspirations, associate failure to their own or other group members' deficiencies and experience a gradual decline in organisational performance.

The relationship between SE and resilience to managerial stressors and the associated effect on organisational performance was investigated by Bandura and Dweck (1988), Wood and Bandura (1989b) and Jourden (1991). These studies established that SE influences the interpretation and effect associated with the stress of decision making failure. Managers with high SE were found to associate failure with task-specific deficiencies, whereas managers with low SE internalized failure as a personal deficiency.

The managers who ascribed failure to task deficiencies were able to remain task-focused and did not divert attention to self-deficiencies and the avoidance of adverse outcomes (Bandura and Dweck, 1988). By remaining task-focused, managers were able to remedy organisational deficiencies without fear of failure and increase performance (Jourden, 1991).

A sequence of six simulated organisational decision making studies were conducted by a group of German cognitive psychologists (Dörner and Schaub, 1994). These studies used the term heuristic competence to refer to a task-specific SE measuring complex problem solving efficacy (Rigas and Elg, 1997). These studies largely concentrated on how human action regulation contributes to complex-problem solving success and failure; "relat[ing] typical errors and mistakes in human planning and decision making to characteristics of the human information processing system" (Dörner and Schaub, 1994, p.1). Dörner (1996) proposed that human action is regulated by the interaction of goal elaboration, forecasting, hypothesis formation, planning, decision making and self-reflection. As discussed in sections ***2.2.3*** and ***2.2.4***, research by Bandura, Wood and others illustrated the bi-directional influence of SE over similar processes. It is not surprising to find parallels in the results between the two research groups. In 1994, Dörner and Schaub reviewed the six studies that investigated human planning and decision making in complex simulated organisations. They concluded that errors in complex decision making situations can be attributed to: (1) the restricted capacity of human conscious thinking, (2) the need to guard feelings of competence and efficacy, (3) the weight of the actual problem and (4) forgetting. SE (heuristic competence) was found to influence decision making errors through mediating the need to guard efficacy and the perceived weight of the problem. Two studies in the series by Dörner and Pfeifer (1990) and Schaub and Strohschneider (1992) found evidence to support a positive relationship between SE (heuristic competence) and performance in simulated organisations. The findings of both studies suggest SE contributes to successful decision making through moderating the perceived problem complexity, underlying approach to problem solving and motivation for success.

The simulated studies discussed so far are concerned with the effects of SE over tactical organisational decision making which, despite its complexity, often has clearly defined goals (increase revenue, reduce staff turnover etc.). Bandura (1997) also suggests a positive relationship exists between SE and more esoteric strategic organisational decision making, for example policy decisions and generating mission statements. Research by Jatulis and Newman (1991) examined the influence of SE on strategic policy development in the public health sector. Policy development was seen to present unique problem solving considerations as there are often poorly defined goals, multiple stakeholders with conflicting interests and regulatory constraints. They found that managers with low SE had a high need for cognition and delayed their decision making processes to ensure that all available information was accounted for. Conversely managers with high SE were more willing to trust their instincts and make decisions based on adequate but incomplete information.

Bandura (1997) notes that the findings of field studies related to SE in organisational decision making are in accord with simulated laboratory investigations. A review of the literature indicates the majority of these studies focus on the effects of SE over interpersonal processes internal to the organisation (teamwork effectiveness, leadership, personal development etc.). Given that these studies are not directly investigating the relationship between general organisational performance and SE, they will not be reviewed in this thesis.

In 1994, Baum surveyed the owner/operators of firms in the architectural woodwork industry. His research involved investigating the relationship between general personality/cognitive traits and organisational growth over a four period. Growth was measured through profit, revenue and staff change. His research concluded that owners who had achieved a high level growth shared a number of dispositional traits and attitudes; (1) a clear vision of what they wanted to achieve, (2) a high belief in their efficacy to achieve and (3) self-set challenging goals. Another study by Jenkins (1994) found that managers with low SE achieve lower levels of company growth compared to

individuals with high SE. He also found that managers with low SE faulted the assessments of company success as being biased and unfair.

Krueger and Dickson (1993, 1994) conducted a series of studies on the effect of SE over entrepreneurial decision making. They concluded that entrepreneurs with high SE focused more on the pursuit of opportunity, while those with low SE focused on the avoidance of risk. Krueger (1994) further detailed the effect of SE over entrepreneurial activity; arguing that a resilient sense of high SE allowed entrepreneurs to persist and succeed despite the hardships, setbacks, failures and social discouragement inherent to innovative pursuits. Lucas and Cooper (2005) recently conducted a general analysis of literature related entrepreneurial SE. They found that SE was an important characteristic to differentiate founders of growing start-up companies from those that remain relatively small. SE was also found to be positively related to self-assessed creativity and technical skill. These findings were consistent with research on entrepreneurial SE by Anna, Chandler, Jansen and Mero (2000), Baum and Locke (2004), Boyd and Vozikis (1994), Chandler and Jansen (1992), Chen, Greene and Crick (1998), Krueger (2000), Krueger and Brazeal (1994) and Markman, Balkin and Barron (2002).

Studies by Hill, Smith and Mann (1987) and Jorde-Bloom and Ford (1988) investigated the relationship between SE and managerial acceptance of innovation and advanced technology. They found that the willingness to innovate was largely determined by the individuals' self-assessed ability to understand and cope with the new technology. These studies concluded that individuals with high SE are more willing to accept innovation and the risks associated with adopting advanced technology. Successful operation of an organisation will often require frequent adoption of new technologies and processes (Jorde-Bloom and Ford, 1988). An empirical study by Judge, Thoresen, Pucik and Welbourne (1999) considered seven dispositional traits and their influence over coping with organisational change. A composite positive self-concept scale was constructed comprising of GSE, locus of control, self esteem and positive emotionality. A positive correlation of .58 ($p<.01$) between the composite scale and self-report measure of coping with change was found. While the GSE concept was not

isolated in this research, principal component analysis indicated that GSE accounted for .85 of the variation in the positive self-concept composite scale.

The general body of literature focused on SE and its influence in organisational settings is substantial. The majority of studies suggest a positive relationship between SE and various organisational performance factors. These studies are well documented and in most cases demonstrate very good levels of statistical rigour. There are however three limitations in the current research of relevance to this thesis' focus. (1) There has been no research that has investigated the impact of SE over organisational financial performance in small to medium sized organisations. (2) No studies have examined the relationship between SE and organisational performance in small to medium sized enterprises across multiple industries. Most studies have focused on a singular industry or limited regional locality.

2.2.6 Individual SE Traits

The general cognitive, personality and behavioural differentiations between high and low SE are comprehensively documented in the literature. The precise explanation of the differentiation is largely determined by the domain focus of the studies. This thesis will only summarise the differentiation of high and low SE from a decision making perspective. Individuals with high SE have a strong underlying belief in their ability to solve problems and achieve their goals (Bandura, 1997). They self-set ambitious goals and apply appropriately structured analytic decision making strategies to achieve these goals (Wood and Bandura, 1989). Effective reactions to discomfort and uncertainty are managed effectively and treated as acceptable and sometimes useful emotions (Churchill and McMurray, 1989). Failure is treated as part of a learning process and useful in refining future decision making (Bandura and Wood, 1989). High SE stems from past successes, positive encouragement and witnessing others succeed through perseverance (Bandura, 1997). An individual with high SE views complex decision making problems as challenging, but within their capability to resolve given adequate effort is expended and specific technical competencies are present.

Individuals with low SE doubt their capability to solve unfamiliar or complex problems (Bandura, 1997). They usually set very humble or easily achievable goals (Wood and Bandura, 1989). When confronted with complex problems they apply an improvised and poorly structured approach to decision making. Risk avoidance is common with unfamiliar, complex or challenging situations being avoided for fear of failure (Wood and Bandura, 1989). Failure is seen to be a reflection of self-worth, indicative of actual capabilities and to be avoided when possible. Effective reactions are viewed as warning signals for lack of ability and a precursor to failure (Churchill and McMurray, 1989). Low SE usually develops from past failures in important pursuits, a lack of positive encouragement and support, witnessing others fail even when significant effort is expended and negative physiological and psychological responses to challenging situations (Bandura, 1997). An individual with low SE views complex decision making as challenging, threatening and outside of their personal capability to resolve. Any attempt to resolve will result in failure, the problem should be avoided if possible.

2.2.7 Inter-correlations between SE and Independent Variables

SE is generally considered one of the central dispositional determinants of human cognition, behaviour and personality (Bandura, 1997), influencing the development and manifestation of other dispositional traits (Bandura, 1986). Past research on SE has detailed a number of strong inter-relationships between SE and other dispositional traits. These relationships have been demonstrated both conceptually and empirically. Given the importance of SE it has been linked to a myriad of dispositional traits and outcome variables in a wide scope of research domains. A meta-analysis of the literature determined the most common dispositional traits related to SE in organisational and decision making research are; ambiguity tolerance, resilience, optimism, emotional stability, locus of control, self-esteem, confidence, learning style and risk-appraisal. This review will only focus on the relationship between SE and the variables addressed in this thesis. The relationship between AT and SE has been addressed in section ***2.1*** and will not be discussed in this section.

The relationship between SE and resilience has been explored by a number of studies across varied research domains. A bi-directional relationship between the concepts is generally accepted (Bandura, 1997). Research has determined that this relationship effects both the development of SE and resilience (Bandura, 1997; Pajares, 1997; Pajares and Schunk, 2001), and an individual's decision making approach to solving complex problem situations (Pajares and Miller, 1994; Pajares, 1997; Schunk, 1981). Sections ***2.2.3*** and ***2.2.4*** have explained how past success act as an antecedent for positive SE. Frequent past successes then act to reinforce and create a resilient sense of positive SE (Bandura, 1997; Pajares, 1997). Once a resilient sense of SE is established it will take frequent and powerful failures, directly relevant to the self-concept of the individual, to lower SE and weaken resilience (Bandura, 1997). Bandura (1997) and Pajares and Miller (1994) explain why a resilient sense of SE is difficult to change; individuals recall past successes when faced with failure or adversities, attributing negative feedback to task rather than personal deficiencies. By not associating negative failure to personal deficiencies an individual's SE is unaffected (Bandura, 1997). Earlier research by White (1982) concluded that resilient SE allows individuals to subconsciously ignore or discount rejection and failure to ensure their existing SE is not undermined. A general conclusion of the literature is that SE and resilience act to continually reinforce each other through their positive bi-directional relationship.

The effect of resilience over SE has also been found to have decision making implications during a complex problem solving task. White (1982) argued that a resilient sense of SE enabled individuals to view failures as a learning experience. Failures were seen to be an indication that more effort and resources need to be committed to the task, and not an indication of personal inadequacy. By attributing failure to effort or resource inadequacies, individuals maintained a feeling of control over the problem situation, enabling them to maintain SE and commit to resolving the situation (Bandura, 1997). Bandura (1988) proposes that resilience and SE determine an individual's level of motivation, influencing the amount of effort and perseverance committed to a challenge. "When faced with difficulties, people who have self-doubts about their capabilities slacken their efforts or abort their attempts prematurely and

quickly settle for mediocre solutions. Those who have a strong belief in their capabilities exert greater effort to master the challenge" (Wood and Bandura, 1989, p.365). A resilient sense of positive SE therefore enables an individual to remain confident in their capabilities to resolve a problem despite initial setbacks and to continue to set ambitious goals in the face failure.

While a resilient sense of SE is generally an asset to individuals facing complex and challenging problem situations, it can also be a liability. Research by Audia, Locke and Smith (2000) found that, in times of strategic change, managers with a high level of confidence and persistence were less adaptable to new environmental demands. These concepts are closely related to SE and resilience. They argue that managers with confidence and persistence have developed this through experiencing frequent past successes. When faced with complex or challenging problems these managers relied on, and referred to, successful strategies employed in the past. This strategy of relying on previously successful strategies can become counter productive in radically new situations. Managers with a persistent sense of confidence were found to be less willing to adapt to new situations or listen to feedback from others. These managers were blinded to the real aspects of their organisations problem by their dogmatic self-confidence, exhibiting lower performance levels than the less persistent managers. A study by Robins and Beer (2001) investigated the personality implications of resilient positive self-beliefs. They concluded that positive self-beliefs were beneficial in the short-term but costly in the long-term. The positive short-term effects were congruent to the findings of other authors like Bandura. However, the long-term personality costs of resilient high SE included individuals being overly confident, narcissistic and ego involved. These individuals were found to engage in self-serving attributions to maintain their SE and ultimately demonstrated no difference in performance to other test subjects.

Present SE literature acknowledges that there is a positive relationship between SE and general planning behaviour. This relationship has been reported in various fields including organisational planning, athletic training and patient health plan development (Bandura, 1997). The majority of these studies are grounded in clinical recovery,

educational development and anxiety management. Planning as a concept has no precise or generally accepted definition in the literature. Throughout SE literature, planning is rarely referred to as 'planning'. Some commonly used alternatives are analytic strategy, analytic thinking and system modeling (Bandura, 1997). While these concepts are not perfectly interchangeable with planning, they all relate to the systematic analysis of a complex system to develop a logical course of action to resolve given problems. Therefore, these concepts are close to the definition of planning adopted by this thesis. Research will only be reviewed which discusses the relationship between SE and planning in an organisational context.

To date, research has largely viewed planning as a mediating variable between SE and success (see figure 4 section ***2.2.4***, sourced from Wood and Bandura, 1989, p.379). As discussed earlier in this chapter, Wood and Bandura (1989) concluded that an individual's SE directly influences their use of appropriate analytic strategies in a complex problem solving environment. Appropriate analytic strategies were not specifically defined in the research. However, traits of appropriate and inappropriate analytic strategies were identified; appropriate strategies were explained as "continuing to set challenging goals, and using analytic strategies in efficient ways that aid discovery of optimal managerial decision rules" (Wood and Bandura, 1989, p. 373-4), inappropriate strategies were explained as "becoming more and more erratic in analytic thinking, lowering organisational aspirations and achieving progressively less in the organisation being managed" (Wood and Bandura, 1989, p. 373). This research therefore identified a positive relationship between SE and the use of appropriate analytic strategies. A positive relationship between SE and goal theory is also well documented in the literature (Bandura, 1997; Locke and Latham, 1984). Wood and Bandura (1989) and Bandura (1997) identified a bi-directional relationship between analytic strategies and goal ambition. They found that when an individual applies appropriate analytic strategies to a problem situation, they obtain a better comprehension of the problem requirements and are able to set more ambitious goals. Conversely, as goals are in essence the focus or final stage of a plan they act to influence the development of the earlier stages in the plan (analytic strategies) (Wood and Bandura, 1989).

In general, research on the relationship between SE and planning has primarily focused on the broad appropriateness of planning. This has been done through considering elements such as the randomness of planning, the speed of decision making and use of consistent logic. Consequently, there is a gap in the literature related to research on the relationship between specific elements of planning orientation and SE. Earlier computer simulated organisational research by the author found a significant positive relationship between SE and planning (Walley, 2004). These findings will be discussed in section ***2.4.6***.

2.2.8 Gaps in the literature

The body of literature focused on SE and its influence in organisational settings is substantial. These studies are well documented and in most cases demonstrate very good levels of statistical rigour. There are however three limitations in the current research of relevance to this thesis' focus. (1) There has been no research that has investigated the impact of SE over organisational financial performance in small to medium sized organisations. (2) No studies have examined the relationship between SE and organisational performance in small to medium sized enterprises across multiple industries. (3) The relationship between SE and specific cognitive sub-elements of planning (PO) has not been investigated. To date planning has only been considered as a general mediating process between SE and performance.

2.2.9 Hypotheses

The general findings in the literature support a positive relationship between the SE of organisational decision makers and organisation performance and behaviour. This relationship may be either direct or indirect and hypotheses are formed for each argument. Studies to date have found that decision makers with high SE (1) have usually experienced frequent past successes, (2) self-set more ambitious goals, (3) use more appropriate problem solving strategies, (4) approach failure from a positive learning approach, (5) get excited and energized by challenges and stress, and (6) openly exhibit confidence when approaching complex and uncertain problem solving situations. As this

thesis concerns organisational decision makers responsible for strategic decisions, it is reasonable to assume participants will face novel and challenging situations on a frequent basis. Hypothesis H^{3AT} addresses the relationship between AT and SE in section ***2.1.8***. Note: the precise nature of appropriate planning in H^{4SE} will be discussed in the planning chapter of this thesis. A high SE is deemed preferable; leading to the following is hypothesis:

> *H^{1SE}: The self efficacy of the key organisational decision maker will be directly positively associated with firm financial performance.*
>
> *H^{2SE}: The self efficacy of the key organisational decision maker will be indirectly positively associated with firm financial performance.*
>
> *H^{3SE}: The self efficacy of the key organisational decision maker will be positively associated with resilience.*
>
> *H^{4SE}: The self efficacy of the key organisational decision maker will be positively associated with a preferable planning orientation.*

2.3 Resilience

In this section, I review the dispositional construct of resilience (RES). (1) I compare various definitions of RES and similar constructs, developing a specific definition for this thesis. (2) I discuss the emergence and development of RES across various research domains. Particular focus is given to the application and research of RES in organisational settings. (3) I summarise generic construct profiles from the literature regarding high and low RES dispositions. (4) I review the relationship between RES and the other dispositional traits used in this thesis. (5) I summarise the gaps in the literature related to RES. (6) I conclude the chapter by presenting my hypothesis related to the RES construct.

2.3.1 Definition and Core Elements of RES

Throughout the literature RES is also referred to as psychological resilience, adaptive coping, adversity quotient, hardiness, resourcefulness, learned optimism, stress

coping and vulnerability. Greene (2002) explains that while the core themes of the concept remain largely consistent, these terms are not perfectly interchangeable as minor variations in definition are offered by most researchers.

Given this variability, RES is generally considered to be a multidimensional personality concept, which cannot be represented by a single concept, characteristic or trait (Newman, 2005). Newman (2005) suggests the definition of RES is largely determined by the relevant behaviours and actions of the particular domain of study. Consequently there is no commonly accepted definition of RES in the general literature. However, most definitions share common themes of coping, stress management, adaptation and recovery from adverse reactions/failures. Common domains of study for the RES concept include clinical, behavioural and cognitive psychology, psychopathology (child and geriatric), health care (recovery and trauma), education (developmental learning), social work (abuse victims), and organisational behaviour (employment relations, career development, leadership and organisational change). The degree of definitional variability both within and between these domains is substantial. It is therefore necessary to consider the core components of the RES construct to ensure these elements are accurately captured by the definition adopted by this thesis. Kobasa (1979), Kobasa, Maddi and Puccetti (1982), Maddi (2002) and Wiebe (1991) propose that RES (hardiness) is composed of three major components; (1) control: perception that life experiences are predictable and controllable, (2) challenge: the belief that change is normal and represents a challenge rather than a threat, and (3) commitment: believing in the importance, interest value and meaningfulness of activities. The outcome of the interplay between these components is believed to determine an individual's ability to cope, recover and take corrective action after experiencing failure or a stressful situation (Maddi, 2002). The components and outcomes of RES are generally accepted; however definitions in the literature differ based around the cognizance of particular outcomes or components. For example, studies from the health domain focus on coping and recovery, while organisational behaviour studies focus on control, commitment and corrective actions.

This variability made it somewhat difficult to find a starting point for the definition of RES in this thesis. Definitions of RES vary greatly between generalist and domain specific orientations (Greene, 2002). Generalist approaches view RES as a broad frame of reference or system of beliefs that guide individuals in coping with environmental challenges (Maluccio, Pine and Tracy, 2002; Masten, 2001; McCubbin, Thompson, Thompson and Fromer, 1998; Richman and Bowen, 1997). This perspective views RES as a general set of skills and attributes characterized by social competence, problem solving skills, autonomy, self-esteem, sense of purpose and ambition (Maluccio, Pine and Tracy, 2002). This perspective is common in research reviewing RES and its antecedents as psychological constructs, or determining and testing measures of the construct (Connor and Davidson, 2003). As this is not the focus of this thesis, a more specific definition of RES will be adopted.

Specific definitions of RES are more common throughout the literature. Some examples of RES definitions include; 'stressing the capabilities, assets, and positive attributes of human beings rather than their weaknesses or pathologies' (Saleebey, 2002, p.2), "the capacity to rebound from adversity strengthened and more resourceful" (Walsh, 1998, p.4), "the efforts to restore or maintain internal or external equilibrium under significant threat" (Masten, Best, and Garmezy, 1991, p.430), 'represents good developmental outcomes and sustained competence despite the presence of stress and risk' (Werner, 1995, p.82), and "a dynamic process wherein individuals display positive adaptation despite experiences of significant adversity and trauma" (Luthar and Cicchetti, 2000, p.858). While these definitions are useful in capturing particular components or outcomes of RES, they fail to be comprehensive. From a psychopathology perspective, Reivich and Shatte (2003) referred to psychological RES as an individual's capacity to withstand stressors and not manifest psychological dysfunction, such as mental illness or persistent negative mood. This definition focuses on an individual's capacity to minimise/accept the psychopathological consequences of stress and not allow these consequences to affect their decision making. This definition limits the RES concept to a stress management mechanism.

In 2005, the American Psychological Association (APA) launched a Resilience Initiative program. Russ Newman (2005, p.227), executive director of professional practice at the APA, defined RES as "the human ability to adapt in the face of tragedy, trauma, adversity, hardship and ongoing significant life stressors". This definition again acknowledges the central outcome of RES; the ability to adapt or cope with stressful or uncertain situations. However, it is limited by not addressing components of recovery and corrective action. A more suitable definition can be found in research by Fredrickson, Tugade, Waugh and Larkin, (2003) who based their definition around past studies of Block and Block (1980), Block and Kremen (1996) and Lazarus (1993). They proposed that psychological RES can be defined as the ability to bounce back from negative emotional experiences by flexible adaptation to changing demands. This definition goes some way to encompassing the main components of RES, but is vague in its wording.

Given the absence of a widely accepted definition of RES in the literature, I have defined RES in a manner more relevant to the context of this thesis. I define RES as 'an individual's ability to cope with and recover from psychological stressors, adapt to new environmental demands, and apply corrective measures to decision making routines when confronted with situations of adversity and stress'. The scale measure of RES employed by this thesis is a negatively keyed vulnerability scale from the NEO Personality Inventory (NEO-PI-R) (Costa and McCrae, 1992). This scale targets coping, problem solving ability, stress management and decisiveness. This is discussed in detail later in chapter three.

2.3.2 Why is RES important?

The increased complexity and dynamism of current organisational climates often results in present day managers having to operate in constant states of change and uncertainty. Operating in a climate of this nature will mean that some decisions will ultimately result in failure. These failures can act to undermine the self efficacy and self-worth of the decision-maker, arousing states of psychological stress (Bandura, 1997). This stress is often further compounded by the need to make immediate decisions to remedy the failure. The manner in which an individual copes with failure and the

resultant stresses can have a significant impact over the effectiveness of decision making (Flach, 1997; Ferris, 1998; Maddi 1999, 2002). Flach (1997) suggests that an individual's psychological RES influences these coping mechanisms. Research on the concept of RES indicates a positive relationship between an individuals RES and their ability to recover from initial failures and avoid, or minimise, adverse stress reactions (Flach, 1997; Grotberg, 2003).

Past research has determined that RES acts to influence decision making through allowing an individual to accept the outcomes of their actions, remain calm, persevere in the face of adversity, learn from hardships and failures, remain confident and re-attempt problem solving tasks (Greene, 2002). Consequently RES does not act to influence decision making in the same manner as the other independent variables reviewed in this thesis. Whereas, ambiguity tolerance (AT), self efficacy (SE) and planning orientation (PO) directly moderate decision making skills, RES acts to influence the application of these skills through developing commitment, perceived control and willingness to accept challenges (Kobasa, 1979; Kobasa, Maddi and Puccetti, 1982; Wiebe, 1991).

2.3.3 Emergence of the RES Construct

The RES construct has been of interest to developmental psychologists since the early to mid 1980's (Campbell-Sills, Cohan and Stein, in press). Early studies, for example Block and Block (1980), Rutter (1985), Werner (1982, 1984) and Werner and Smith (1982), generally focused on the positive characteristics of RES applied by children in situations of adversity. In the late 1980's, a significant body of literature in the health domain emerged, focused on the affects of RES over patient coping and recovery in situations of psychological and physical trauma, injury, distress and discomfort (Flach, 1997). These streams of literature were further broadened to encompass the external factors that promote RES in both adults and children (Campbell-Sills, Cohan and Stein, in press). Researchers throughout this period were largely concerned with understanding the characteristics of individual RES and how these characteristics contributed to coping, recovery and adaptation. Later studies in the 1990's broadened in focus and reviewed the antecedents of RES, the bi-directional relationship

between RES and its outcomes, how RES develops across an individual's lifespan and the development of reliable RES measures.

Bonanno (2004) and Campbell-Sills, Cohan and Stein (in press) explain that despite the broadening of research on the RES construct, there are still significant gaps in the literature regarding the effects of RES in a number of key domains. Bonanno (2004) asserts that the literature has, to a large extent, ignored the influence and development of RES in adulthood. Campbell-Sills, Cohan and Stein (in press) also identify the need to develop more validated measures for RES in adult populations, with the majority of measures being healthcare or child specific. Connor and Davidson (2003) argued that the absence of a well validated measure for adult RES has contributed to the lack of research. A recent study by Connor and Davidson (2003) focused solely on the development of an effective scale-based measure of adult RES. This scale appears to be gaining general acceptance in the literature (Campbell-Sills, Cohan and Stein, in press).

2.3.4 RES in Organisations

Despite recent developments, research on the RES construct in an organisational setting is limited. A small group of studies have focused on how RES acts to mediate psychopathological stress factors in organisations, at both a leader (Atwater, Dionne, Avolio, Camobreco and Lau, 1999; Bunker, 1997; Conner and Hoopes, 1997; Ferris, 1998) and subordinate level (Bunce and West, 1996; Maddi, 1999; Wanberg and Banas, 2000; Williams and Cooper, 1998). A limited number of studies have also discussed the idea of collective/structural organisational RES (Conner and Hoopes, 1997; Van Tonder, 2004). Due to this thesis' focus on individual decision making processes, this review will only focus on individual RES.

The relationship between RES and effective leadership has been considered by a small collection of studies. This research largely argues a positive relationship between the constructs. Bunker (1997) investigated the influence of RES over leadership in contemporary organisations. This research concluded that, "when faced with situations of ambiguity, change and uncertainty in an organisational setting…the capacity to assess

and accept one's emotional response and personal vulnerability [negative of RES], coupled with the ability and willingness to model healthy coping behaviours, can serve as a powerful leadership tool to enhance recovery efforts" (Bunker, 1997, p.122). In 1998, Ferris reviewed the relationship between stress and leadership decision making effectiveness, concluding that "leaders, who could otherwise be expected to be highly effective, will be far less effective to the degree that stress is present" (Ferris, 1998, p.42). Ferris (1998) argued psychological hardiness (RES) and well developed coping strategies are the primary mechanisms available to leaders to reduce the psychopathological effects of stress. Research by Conner and Hoopes (1997) examined the relationship between RES and an organisations' ability to cope with change. They found that building RES in employees, leaders and organisational structures was critical for the development of an organisations' change capacity. A similar study by Wanberg and Banas (2000) focused on understanding the factors that influence an employee's ability to cope with change processes. They conclude that personal RES (a composite of self-esteem, optimism and perceived control) was related to high levels of change acceptance in the respondents.

In contrast to the findings of the above studies, Atwater, Dionne, Avolio, Camobreco and Lau (1999) found that RES and hardiness are not important characteristics in leadership performance or development. Their study involved tracking the development of 236 male cadets through four years of military school. The leadership performance and development of the cadets was monitored along with other personality characteristics (RES, physical fitness, self-esteem, moral reasoning etc.) throughout the research. Analysis using stepwise regression found no evidence to support a relationship between RES and leadership. The researchers suggested that this finding was counter intuitive and was possibly caused by low variation in the sample, with all cadets reporting high levels of RES (hardiness).

At a conceptual level, Weick (1993, 1995) discusses the importance of RES to effective sensemaking in organisations. Sensemaking is literally defined as "the making of sense" (Weick, 1995, p.4). It involves structuring the unknown into manageable constructs that can be made sense of, and easily comprehended. The literature related to

sensemaking is largely concerned with understanding how and why it occurs and how it affects outcomes in organisational settings (Weick, 1995). A review of the literature indicates that effective sensemaking is positively associated with organisational performance. Weick (1995) proposes that a number of processes govern sensemaking in organisations. Of relevance to RES is the idea of expectation-based belief-driven processes (Weick, 1995). Expectations guide interpretations and act to alter the basic cognition of events. Expectations are typically entrenched in the mindset of an individual, with most events being interpreted to confirm rather than question their legitimacy. The application of expectations to sensemaking processes has been found to have both positive and negative implications for organisational and individual performance. Expectations can act to simplify and ease interpretation of events, improving decision making efficiency and effectiveness. But, in an attempt to protect existing expectations, they can also limit the quantity and nature of information considered with reference to the event, if it is likely to challenge existing expectations (Weick, 1995).

The effectiveness of expectations in sensemaking processes is to some extent governed by an individuals RES (Weick, 1993). In 1993, Weick re-analyzed the Mann Gulch fire disaster using a sensemaking framework in an attempt to understand why organisations unravel, and how organisations can be made more resilient. Weick (1993) concluded that RES is critical to minimise disruptions in sensemaking, particularly when expectations are incongruous with pertinent events. RES was found to minimise the degree to which an individuals' expectations interfered with their attention to the meaning or understanding of the events they were facing. Individuals with a high level of RES were found to better cope with unfamiliar events and adapt their knowledge and decision making to suit the new context. Weick (1993) argued that the three survivors in the Mann Gulch fire disaster survived due their RES. RES enabled the survivors to remain calm and not panic, to rely on trained survival techniques and to maintain group cohesion in the face of chaos, stress, threat to life and complete disintegration of organisation. In effect the RES of the survivors allowed them to *make sense* of the

situation, call on existing knowledge and maintain their reliance on team work. Avoiding the instinctive flight response adopted by the casualties.

Positive organisational scholarship (POS) is an emergent movement in organisational theory. Despite limited empirical research relating to POS, its acknowledgment of RES as a key element of individual and organisational performance is of interest to this thesis. This movement focuses on uncovering the positive dynamics leading to exceptional individual and organisational performance (Cameron and Caza, 2004). POS differs from some 'traditional' organisational research as it focuses on enhancing and harnessing strengths, instead of the elimination of weaknesses. A core concept of POS is the concept of 'virtuousness' (Cameron, Bright and Caza, 2004). Virtuousness is considered to be the state that "individuals and organisations aspire to be when they are at their very best" (Cameron, Bright and Caza, 2004, p.767). A state of virtuousness is argued to produce 'morale muscle', willpower and stamina in the face of challenges (Baumeister and Exline, 1999).

Virtuousness is believed to influence and be influenced by a number of dispositional characteristics (Cameron, Dutton and Quinn, 2003). RES is considered to be one of the key characteristics that builds virtuousness and also results from it. POS literature generally defines RES as 'the maintenance of positive adjustment under challenging conditions' (Sutcliffe and Vogus, 2003, p. 95). Weick (Chapter five in Cameron, Dutton and Quinn, 2003) argues that RES is essential in allowing individuals and organisations to appreciate and cope with change, 'when organisations should fail but don't, when they bounce back but shouldn't, when they remain flexible and agile but ought to become rigid…the presence of resilience is an extraordinarily positive strength'. POS therefore acknowledges that the growth and enhancement of RES is important in improving organisational, team and individual performance. Conceptual propositions by Sutcliffe and Vogus (2003, p.94) support these sentiments, 'resilience provides insight into how organisations continually achieve desirable outcomes amid adversity, strain and significant barriers to adaptation or development'. They propose that resilience helps organisations to cope with threats at individual, team and organisational levels. This

occurs through allowing organisations and decision-makers to (1) apply broader information processing, (2) loosen control and (3) utilise all available capabilities.

Given the infancy of POS there has been limited empirical research on the linkage between virtuousness and performance (Sutcliffe and Vogus, 2003). A recent study by Cameron, Bright and Caza (2004) sampled 18 organisations and found virtuousness to be positively associated with organisational performance. Organisational performance was assessed by innovation, customer retention, turnover (revenue), quality and profitability. The authors do note that given the limited sample size the findings of this research were only suggestive and not conclusive. There are some general distinctions between this thesis' treatment of RES and the way it is treated in the POS literature. RES as a concept can be classified as both a personality trait and process (Sutcliffe and Vogus, 2003). While this thesis has adopted RES as a personality trait, POS views RES as a process. The personality approach views RES as a stable dispositional trait that can be tested and quantitatively scored. This approach allows individuals to be classified as either resilient or vulnerable. POS criticizes the personality approach arguing that it frames RES as a highly desirable but rare characteristic held by a lucky few individuals (Sutcliffe and Vogus, 2003). In contrast POS adopts a process perspective where RES is seen to be developmental and not inherent. RES is seen to be a common characteristic that emerges during times of threat and develops through experience and mastery of ones motivation system (confidence in success). The RES of an individual, team or organisation is determined by experience of positive adjustment to challenges and not an inherent ability to cope with challenge or threat. While the POS approach to RES has shown some validity in recent studies (Cameron, Bright and Caza, 2004), there is significant evidence through personality, behavioural and cognitive psychology to support the claim that RES is a stable personality trait (Masten and Reed, 2002).

Overall, the body of literature to date is of limited relevance to this thesis due to the research settings, the dependent variables of interest, or the conceptual/anecdotal nature of the research. With respect to the research setting, past research has normally targeted organisations undergoing structural change (Maddi, 1999), to create a stimulus

for the initial stress. In contrast, this thesis is interested in general performance growth and is not specifically targeting particular organisational climates. Due to the psychopathological orientation of these studies the dependent variables were also more concerned with how RES acts to minimize stress levels, maintain general psychological and physical well-being, and assist individuals in adapting to and coping with organisational change processes. Generally the findings of past studies on the RES construct report a consistent positive relationship between RES and stress management, effective personal leadership, tolerance for adversity, recovery from adversity, and dispositional optimism. While the past literature only implicitly mentioned the effect these outcomes were likely to have on organisational performance, there is sufficient evidence to suggest that high RES will have a positive effect on the personal performance and decision making abilities of organisational leaders.

2.3.5 Individual RES Traits

The body of literature related RES has placed an emphasis on profiling the behavioural, personality and cognitive differences between individuals of high and low RES. A general review of the literature found consistencies across the RES and hardiness constructs. Past research has demonstrated that individuals with a high level of RES are more adaptive to complex or stressful problem situations (Flach, 1997). They apply a positive affective approach to their social interactions (Fredrickson, Tugade, Waugh and Larkin, 2003), are extroverted, and maintain close interpersonal relationships and social support networks (Campbell-Sills, Cohan and Stein, in press). When confronted with failure or significant hardship they are able to cope with, and recover from the negative physical and psychological effects (Werner, 1985). Situations of adversity are seen as a challenge or opportunity rather than a threat (McCubbin, Thompson, Thompson and Fromer, 1998; Maddi, 1999). High RES individuals are more likely to apply structured and task-orientated problem solving approaches to cope with adversity (Maluccio, Pine and Tracy, 2002; Penley, Tomaka and Wiebe, 2002), and demonstrate a broader and more effective thought action repertoire (Fredrickson, 2001). Funk and Houston (1987, p.572) reviewed a series of studies related to the construct of hardiness (RES) and concluded that "hardy [high RES] individuals have a good sense of

purpose or meaning (commitment), see change not as a burden but as a normal aspect of life (challenge), and feel that they can influence life events (control). Hardy individuals suffer less…because they are able to transform life events cognitively to make them less stressful". From an organisational perspective Conner and Hoopes (1997), with reference to Werner (1984) and Kobasa (1979), found that high RES individuals possess five personality characteristics: positivism, focus, flexibility, organisation, and proactivity. These characteristics are consistent with studies by Block and Kremen (1996) and Klohnen (1996), who emphasised the positivism, flexibility and positive emotionality of high RES individuals.

When confronted with a problem situation characterised by difficulty and adversity, individuals with low RES will usually perceive it to be threatening and insurmountable (Greene, 2002). This assessment triggers both physical and psychological stress reactions, adversely affecting the judgment and decision making behaviour of the individual (Flach, 1997). Low RES individuals are often unable to cope with these stress reactions (Newman, 2005) and interpret them as a reflection of their capability (Bandura, 1997). The individual effectively recalls past experiences where similar negative stress reactions have been experienced, lowering their perceived mastery of experience and present psychological state (Bandura, 1997). This interpretation acts to undermine their SE, confidence and commitment to resolving the situation (Bandura, 1997). The inability to cope with psychopathological stress reactions also dramatically decreases the individuals' ability to recover and adapt to the situation (Bonanno, 2004; Richardson, 2002). They will often apply maladaptive strategies, self-destructive behaviour or defensive problem solving techniques to minimise the adverse psychopathological effects they are experiencing (Connor and Davidson, 2003), disregarding the actual problem situation (Fredrickson, 2001). Low RES individuals are likely to enter a state of decision paralysis or become apathetic to problem solving (Maddi, 1999). Fredrickson, Tugade, Waugh and Larkin (2003) argue the major differentiating characteristic of Low RES individuals, is that they have an inability to find or experience positive emotions when faced with adversity. Emotional positivism is accepted as a core behavioural element of coping with stress (Folkman and Lazarus,

1980; Masten, 2001; Richardson, 2002). An inability to cope with stress is the primary initiator of the adverse physical and psychopathological states discussed above (Wiebe, 1991).

2.3.6 Inter-correlations between RES and Independent Variables

RES is not considered to be a core dispositional personality trait in the same manner as SE. Consequently, fewer studies have investigated the relationships between RES and other dispositional traits. Due to a heavy research bias towards the health domain, RES has largely been related to constructs from the neuroticism factor of the five factor inventory. A general review of the RES literature determined the most common traits related to RES are; SE, confidence, locus of control, hardiness, optimism, patience, various depression scales, extroversion, vulnerability, self-consciousness, anxiety, anger, assertiveness and emotionality. The majority of these traits are of little relevance to this thesis and will not be discussed further. The relationship between RES and SE has been addressed in the SE chapter and will not be discussed in this chapter.

There has been minimal research regarding the relationship between RES and AT, with no research being directly relevant to the domain of this thesis. A small number of studies have alluded to a possible relationship between the constructs; however none have tested the relationship empirically. Connor and Hoopes (1997) briefly mentioned that the strength of a leader's RES, in a changing organisational environment, is partially reliant on their ability to cope with uncertainty (ambiguity); "manifesting internal flexibility in the ability to conceive of multiple approaches to a situation without becoming locked into a single response" (Connor and Hoopes, 1997, p.21). They also expressed the potential performance implications of RES and AT; "as a result of high flexibility, they are able to avoid wasting resources on ineffective strategies, readily shifting to a new approach when an obstacle is encountered" (Connor and Hoopes, 1997, p.21). A study on the power of vulnerability in leadership by Bunker (1997) argued the importance of RES in coping with ambiguous and uncertain situations in an organisational environment. Research from an employee perspective by Bass (1990, 1998), Harland, Harrison, Jones, Reiter-Palmon (2005) and Wanberg and Banas (2000) propose a positive relationship between

RES and an employee's ability to cope with uncertainty, ambiguity, stress and adversity. These studies and others from the health and psychopathological domains are in consensus regarding the positive relationship between RES and AT. A positive relationship is intuitive given that ambiguous situations are typically characterized by stress (Furnham and Ribchester, 1995) and RES is a core personality construct in coping with stress (Richardson, 2002). Explaining the psychological relationship between these constructs is beyond the scope of this thesis. However, it is reasonable to expect a positive relationship, with both constructs acting to enhance the other in situations of complexity, uncertainty, crisis and stress. Increased RES would act to manage and minimise stress, improving coping and recovery during situations of ambiguity and failure. Due to the minimization of adverse physical and psychological reactions, ambiguous situations would be assessed as a challenge rather than a threat, increasing AT. The direction, strength and nature of this relationship are areas in need of further research.

The relationship between RES and Planning Orientation (PO) has been given little attention in the literature. This is likely due to the lack of established and widely accepted measures for both constructs. A positive relationship between RES and the formulation of effective leadership strategy was alluded to in the research of Bunker (1997), Connor and Hoopes (1997), Harland, Harrison, Jones, Reiter-Palmon (2005). Appropriate PO is certainly a component of effective organisational leadership; however this was not specifically identified by the researchers. Literature related to disaster prevention and management has made reference to the importance of RES in ensuring effective and efficient planning in times of crisis or disaster (Paton, 2003). This relationship was based around anecdotal evidence and not tested empirically. Overall, research on RES and PO has only loosely focused on the general relationship between the concepts. Consequently there is a need to empirically investigate the relationship between particular PO's and RES.

2.3.7 Gaps in the literature

The body of literature related to RES is of limited relevance to this thesis. (1) There is no established or widely accepted definition of RES in the literature. (2) Past research has normally targeted organisations undergoing significant structural change, testing employee RES to stress and shock. In contrast this thesis is interested in general performance growth and is not specifically targeting particular organisational climates. (3) RES studies commonly adopt a psychopathological orientation being concerned with how RES acts to minimize stress levels and maintain general psychological and physical well-being. (4) The present literature has only implicitly mentioned the effect RES is likely to have on organisational financial performance, instead focusing on decision making effectiveness and recovery. (5) Research has predominantly focused on the development and application of the construct by children, with a lack of research directly attributed to adults. (6) There is no focused research on the relationship between AT and RES and very few references to the influence of RES over planning at both a cognitive and process level.

2.3.8 Hypotheses

The general findings in the literature support a positive relationship between the RES of individual decision makers and their ability to confront and resolve complex, stressful and dynamic situations. This relationship may be either direct or indirect and hypotheses are formed for each argument. Studies to date have found that individuals with high RES (1) have an increased capability to cope with stress, (2) are able to recover more readily from the psychopathological adversities of stress, (3) maintain a state of positive affectivity and optimism despite adversity, (4) see problem situations as a challenge not a threat, (5) possess more energy and commitment to completing tasks, (6) apply structured, task-orientated and effective problem solving methods to reduce stress, and (7) are better able to adapt to and accept situations of significant change. As this thesis concerns organisational decision makers responsible for strategic decisions, it is reasonable to assume participants will face stressful, dynamic and challenging situations on a frequent basis. Hypothesis H^{3SE} addresses the relationship between RES and SE in

the SE chapter of this thesis. A high RES is deemed preferable; leading to the following is hypothesis:

> *H^{1RES}: The resilience of the key organisational decision maker will be directly positively associated with firm financial performance.*
>
> *H^{2RES}: The resilience of the key organisational decision maker will be indirectly positively associated with firm financial performance.*
>
> *H^{3RES}: The resilience of the key organisational decision maker will be positively associated with ambiguity tolerance.*

2.4 Planning Orientation

This chapter will discuss the concept of planning orientation (PO) as a dispositional trait of organisational decision-makers. (1) I will discuss why PO is important in an organisational context, providing a general overview of the construct. (2) I review the distinction between PO and the other dispositional traits used in this thesis. (3) I will define and review past literature related to the seven sub-elements of the PO construct. (4) I review research used as a basis for development of the PO construct. (5) I profile the general planning behaviours and associated performance exhibited by different PO typologies. (6) I then review my Masters' research related to the effects of PO on performance in a complex behavioural computer simulation (Walley, 2004). (7) I identify the gaps in the literature related to the definitions of planning and PO and adopt a definition for this thesis. This section is reinforced by examples from my Masters' Research. Eight, I review the gaps in the literature related to PO. (8) I present my hypothesis.

2.4.1 Overview

The increasing dynamism and uncertainty of modern business environments present managers with unpredictable, unstable and complex decision making domains (Roberts, 2004). To effectively manage their environment, decision-makers often rely on planning in an attempt to predict future states and simplify decision making demands

(Foster and Kaplan, 2001). Past research in the field of organisational planning has mainly focused on large organisations where strategic and tactical planning is formalised and performed by groups of individuals (Brews and Hunt, 1999, Rogers, 1981). This field of study is of minimal relevance to the individual decision making emphasis of this thesis. Research in relation to small business planning has predominantly investigated the value of planning and its presence or absence in an organisation (French, Kelly and Harrison, 2004). However, these studies have not empirically tested how plans are formulated (Gibbons and O'Connor, 2005) and the antecedents of effective planning (Matthews and Scott, 1995). Case study methods are also common leading to findings of some studies being largely organisation specific (French, Kelly and Harrison, 2004) or prescriptive in nature (Robinson and Pearce, 1984).

There is general agreement that effective and appropriate planning has a strong positive association with organisational performance (Gibbons and O'Connor, 2005; Millar and Cardinal, 1994). A meta-analysis of studies on the effects of planning over the performance of small firms by Schwenk and Schrader (1993) concluded that planning was positively associated with financial performance. However, to date the literature on organisational planning has given little attention to what influences an individual's ability to formulate effective plans. Research in the field of cognitive psychology has investigated the process through which individuals develop models or 'schema' to interpret, simplify and cope with complex systems (Kahneman, Slovic and Tversky, 1982; Marshall, 1995). Planning is considered a fundamental cognitive ability that allows individuals to organise and structure their daily lives and futures (Güss, 2002). Yet not all plans are successful, accurate or useful with some decision-makers being inherently more effective at planning than others (Dörner, 1996). Of interest to this thesis is how PO, as a dispositional trait, influences inherent planning effectiveness. Studies in this field have found that an individual's ability to structure complex problems into meaningful and manageable systems and plans is partially determined by inherent dispositional traits (Hoc, 1988). A general review of the literature related to cognitive decision making processes indicates that planning ability has been found to positively influence decision making style and effectiveness (Dörner, 1996; Dörner and Pfeifer

1993; Funke, 2001; Güss, 2000; Sterman, 1987; Strohschneider and Güss, 1996 and Walley, 2004). However the relationship between PO and performance has not been empirically tested, leaving a significant gap in the literature. This thesis aims to address this gap.

2.4.2 Distinction between PO and Independent Variables

It is important to highlight that PO is fundamentally different to the other independent variables used in this thesis. First, PO is not a widely accepted dispositional trait/construct in the general body of literature. This is demonstrated by the lack of a widely accepted definition and minimal application of the concept. The PO construct applied by this thesis is developed largely from the work of Güss (1997, 2002) and my Masters thesis (Walley, 2004). My Masters research demonstrated some support for PO fitting the definition of a dispositional trait (Walley, 2004). As explained by Eysenck (2001) and McAdams (1992) a dispositional trait is any distinguishable, relatively enduring way in which one individual differs from another. The trait must be, (1) consistent across multiple contexts and (2) allow comparison to other people based on relatively high and low levels of the characteristic (McAdams, 1992). Research by Güss (1997) and Walley (2004) was not longitudinal in design so the enduring requirement of the definition has not been empirically tested. The research did demonstrate strong support for the ability to distinguish between high and low levels of the various PO elements (Walley, 2004). Anecdotal interview data also suggested that the PO behaviour exhibited in simulation research is applied by participants in everyday planning activities (Walley, 2004). This suggests the dispositions are enduring across varied contexts. These results are supported by Güss (2002) who concluded there are clearly distinguished planning differences between Brazilian, Indian and German participants in respect to complex problem solving tasks. Providing cross-cultural evidence for the PO constructs ability to distinguish between different planning behaviours. Second, PO is not a singular dispositional construct like AT, SE or RES. Instead it is a label used to group seven separate elements of cognitive ability/tendency that influence the planning process. Finally, PO is measured using a problem solving scenario which elicits planning behaviour to isolate the seven dispositional tendencies. This contrasts the items scales

used by the other independent variables in this thesis. The justification for measure selection is discussed in chapter three.

2.4.3 Sub-elements of PO

PO is not a singular dispositional construct. It is a label for seven individual, but statistically related (Walley, 2004), abilities/tendencies that influence an individual's planning process. This section will define and discuss the theoretical basis of the sub-elements of PO. These definitions are developed from the research of Güss and Strohschneider (1996, 1998), Güss (2002) and Walley (2004). The sub-elements are: (1) complexity, (2) specificity, (3) depth, (4) width, (5) certainty, (6) control, and (7) priority. Based on the literature, each section will offer a general conclusion regarding each sub-elements association with planning and organisational performance. For modeling purposes the first four sub-elements are grouped around the term planning content, while the final three are grouped around the term planning strategy.

Complexity refers to the number of elements, variables or factors considered by an individual in the planning process (Güss and Strohschneider, 1996). Complexity is assessed by the number of stated planning elements. Planning elements are defined as any explicitly listed planning activity (Güss and Strohschneider, 1998). Various studies have empirically established a positive association between planning complexity, effective planning and organisational performance (Diffenbach, 1982; Huntsman, 1994; Miller, Burke and Glick, 1998). These studies focus on the formalised complexity of the strategic plan, only briefly acknowledging the likely importance of managerial cognitive abilities (Millar, Burke and Glick, 1998). They do however provide evidence for the likely relationship between cognitive complexity and effective planning ability.

Studies specifically related to individual cognition and planning have found that complexity influences an individual's ability to understand the complex relationships of a problem and account for more environmental factors (Güss and Strohschneider, 1996). A conceptual meta-review by Wang and Chan (1995, p.35) summarised five empirical studies concluding that "cognitively simple individuals tend to perceive stimuli in simple

and minimally differentiated dimensions and apply fixed rules to organisational stimuli…cognitively complex individuals tend to perceive several dimensions in stimuli and apply more complex rules to interpret phenomena". They concluded that cognitively complex individuals exhibit four characteristics; they (1) attend to broader ranges of information (Tuckman, 1964), (2) search for more information (Tuckman, 1964), (3) spend more time interpreting information (Dollinger, 1984) and (4) have a more accurate perception of the environment (Streufert and Driver, 1965). Another conceptual review by Jonassen (in press) suggested that an individual's cognitive control positively influenced their ability to solve complex problems. He argues that individuals with high cognitive control have the ability to consider more alternatives and complexity during problem solving processes. Exploratory research by Calori, Johnson and Sarnin (1994) suggested that the cognitive complexity of a CEO is positively associated with planning complexity, and that in order to be successful, a CEO must have a level of cognitive complexity to match their organisation's environment. The findings of this research were not statistically conclusive given a limited sample size of 26 (Calori, Johnson and Sarnin, 1994). Dörner (1996) also emphasizes the significant positive relationship between a decision-maker being able to manage high complexity and effective planning. Available literature suggests that planning complexity is positively associated with effective planning and organisational performance.

Specificity refers to how specific or detailed an individual is when formulating a plan (Güss and Strohschneider, 1996). Specificity is assessed by the number of stated measures. Measures are defined as any explicitly listed planning activity that is accompanied by an explanation of how the activity will be implemented or achieved (Güss, 1997). A review of the organisational planning research indicates that specificity and complexity are seen as synonymous concepts. In some studies it is often unclear which concept is being referred to, as the methodology is not explained in adequate detail. The studies mentioned previously (Calori, Johnson and Sarnin, 1994; Diffenbach, 1982; Huntsman, 1994; Miller, Burke and Glick, 1998) appear to consider specificity as an element of complexity. These studies therefore provide some indication of a positive relationship between specificity and effective planning. The literature in the area of

planning detail is riddled with non-scholarly publications which provide minimal evidence of their research method to support their claims. A general consensus of the literature is that planning detail (specificity) is positively related to effective planning and organisational performance. Yet no study has comprehensively investigated the effects of individual cognitive specificity over planning. Research by Güss and Strohschneider (1996) is more relevant in this regard. They argue that specificity directly influences effective planning as an individual needs to understand not only what to achieve, but how to achieve it. Dörner (1996) labours the necessity of considering the small and specific details when planning and problem solving to ensure success, "plans often fail because the planners have not factored in all the irksome little conditions…that have to be dealt with to succeed" (p.167). Dörner (1996) goes further to argue that specificity is the key determinant of an individual's ability to effectively implement their plan; as it is unforeseen details that act to curtail the central assumptions of the plan. These studies are not focused on organisational planning, focusing instead on planning under personal (Güss and Strohschneider, 1996) or simulated situations (Dörner, 1996). The literature suggests that planning specificity is positively associated with effective planning and organisational performance.

Planning depth refers to the number and sequence of activities/stages applied by the participant to achieve their end objective (Walley, 2004). This includes actions that move the plan forward, or elicit further information from the environment with the intention of moving the plan forward (Güss, 1997). Planning depth is illustrated by the number of explorations in a planning scenario (Güss and Strohschneider, 1996). Each arrow in figure 6 represents a planning exploration. Planning depth, as defined by this thesis, has only been discussed to limited extent in the organisational planning literature. The perspective of planning depth adopted by the literature has changed over time (Bracker, Keats and Pearson, 1988; Rogers, 1981; Schwenk and Schrader, 1993, Barringer and Bluedorn, 1999). Throughout the period of approximately 1960 through 1985 planning depth was seen to be an essential component for accurate forecasting of future actions (Rogers, 1981). Depth and planning success was in effect defined solely by time horizon, length and the accurate prediction of the environment. This approach

was limited as it failed to consider, in appropriate detail, the stages or steps used to reach the goal or planning horizon. Later developments in the literature led to depth being seen as an ability to anticipate the consequences of actions and identify information and actions that will be required at later stages in the plan (Güss and Strohschneider, 1996). Depth is not only seen as a method of prediction, but also an indicator of the plan's ability to elicit required information from future states and map a course of likely actions (Güss and Strohschneider, 1996). A review of the literature generally indicates a positive relationship between planning depth and organisational performance (Barringer and Bluedorn, 1999; Das, 1987, Schwenk and Schrader, 1993). The majority of literature related to planning depth focuses on the predictive accuracy of the plan to define success. This contrasts to this thesis which is interested in the cognitive method applied by the individual to structure the sequence of their plan. Studies by Das (1987), Güss (1997), Güss and Strohschneider (1996) and Walley (2004) conclude that an individual's planning depth/horizon influences their cognitive ability to see the repercussions of present actions on future events. These studies all argue a positive relationship between planning depth and performance. This thesis concludes from the literature that planning depth is positively associated with effective planning and organisational performance.

Planning width assesses whether an individual acknowledges the possible contingencies of their actions (Güss, 1997, 2002). Width is illustrated by the number of contingent paths considered in a planning scenario (Güss and Strohschneider, 1996). For example figure 6 illustrates three contingent paths (***). Contingency planning is extensively researched in the literature. Common domains of study include crisis and risk management, emergency/disaster recovery and strategic planning. A review of the literature indicates a strong positive relationship between contingency planning and performance (Bloom and Menefee, 1994; Evans and Elphick, 2005; Lorange, 1996 and Paton, 2003). Early research by Miesing and Wolfe (1985) studied the linkage between planning approaches and varied environmental conditions. With reference to Thompson (1967) they concluded that an individual's consideration of cause-effect relationships and preferences regarding possible outcomes of choices can influence planning decision types. The study did not investigate the direction of this relationship.

Appropriate contingency planning has been found to improve organisational performance through increasing the flexibility of strategic plans. Evans and Elphick (2005) argue that this flexibility allows plans to be adaptable to unexpected events (or reduce the occurrence of unexpected events). Mitroff (1988) studied the process through which CEO's manage crisis. He concluded that contingency planning was essential in managing crisis, creating a capability to prevent, prepare, contain and recover from damage. A recent study by Waldersee and Griffiths (2004) argues the need to consider contingencies throughout the process of organisational change. These studies are only a brief summary, but echo the general sentiments throughout the planning literature (Rogers, 1981; Mintzberg, 1994; Senge, 1990 etc.). One limitation of the research to date is that contingency planning is predominately assessed at a planning or organisational level. There is minimal consideration of the effect that the cognitive dispositions of organisational planners have over planning width. Paton (2003) proposed a social cognitive model for disaster preparedness and suggested the possible influence of cognitive processes over contingency planning; however this relationship was not tested. Research focused on new business start-ups by Lorange (1996) concludes that contingency planning is a critical component to entrepreneurial success. He states that entrepreneurs who apply multi-focused planning approaches are better able to capitalize on unexpected growth opportunities. This research was limited by not considering in detail the antecedents of effective contingency planning. From a cognitive perspective these arguments are congruent with Dörners' (1996) findings that adequate contingency planning improves decision making performance. Dörner argues that performance improves by reducing the uncertainty of complex problem situations, through helping individuals anticipate unexpected events. He found that when faced with dynamic problem situations, decision-makers must have the ability to consider the alternative consequences or outcomes of their actions if their plan is to be successful. If an individual fails to consider multiple consequences, their plan will lack the adaptability required to successfully navigate a complex and dynamic environment, leading to failure. This thesis concludes from the literature that planning width is positively associated with effective planning and organisational performance.

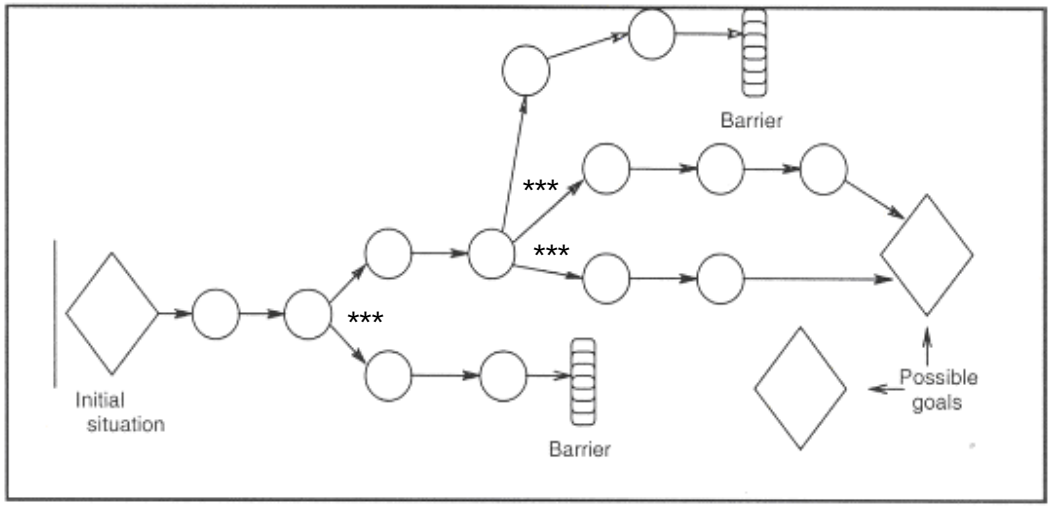


Figure 6: Abstract Schema of a Plan. Source Güss (2002)

Planning certainty refers to how certain a decision-maker is about the context and situation surrounding a problem (Güss and Strohschneider, 1996). Individuals are classified as either certain or uncertain (Walley, 2004). Certain individuals see situations as clear; they view the situation, believe the problem is clear and act in accordance to solve the problem. Uncertain individuals view situations as contextually dependent, questioning information as it is relates to the situation before deciding on a course of action. They have a tendency to be more exploratory in their decision making approaches. Organisational planning research has paid some attention to the influence of cognitive certainty over planning processes. However, the body of literature is underdeveloped in a number of key areas. (1) There is no clear definition of certainty. (2) The concept is not treated as a dispositional trait in the majority of the literature. (3) Some studies are unclear as to whether certainty is being referred to at an individual, planning or organisational level. Nonetheless the literature does provide support for a negative association between planning certainty and organisational/planning performance.

Generally as planning certainty increases, the relevance of the plan to the external environment decreases (Blackman and Henderson, 2004; Mintzberg, 1993), this in turn adversely effects organisational performance. Mintzberg (1993) asserts that the main

purpose of planning is to reduce uncertainty and increase control. He argues that this desire for certainty presents a major pitfall for organisations "an obsession with control leads to all kinds of behaviours…one is aversion to risk, which means a reluctance to consider truly creative ideas and truly quantum changes, both of whose effects are unpredictable and so beyond formal planning" (Mintzberg, 1993, p. 33). Planning certainty impairs an organisations ability to grow, adapt and change (Mintzberg, 1993). Studies by Blackman and Henderson (2004), Combe and Greenley (2004), Harrison (1991), Huntsman (1994), Mintzberg (1993), Preble (1992), Reeder (1995) and Slocim, McGill and Lei (1994) all argue the importance of uncertainty in organisational planning and decision making processes. Similar to contingency planning, these studies argue that uncertainty helps to improve planning flexibility and adaptability (Combe and Greenley, 2004). Combe and Greenley (2004), Mintzberg (1993) and Reeder (1995) emphasise that uncertain planning approaches are becoming essential to successfully plan in modern dynamic and uncertain environments. The strategic flexibility that results from uncertain planning allows firms to respond and successfully adapt to environmental change (Combe and Greenley 2004; Evans 1991; Greenley and Oktemgil, 1998).

Blackman and Henderson (2004) reviewed conceptually the cognitive elements of certainty. They argued that an uncertain cognitive approach "acts to refute, rather than confirm, mental models about the future…such processes lower expectations and certainty, thereby opening the organisations and enabling mental models to be more accurate" (p.253). As this research was conceptual by design the influence over organisational performance was not empirically discussed. Nevertheless this research does provide conceptual evidence for a relationship between cognitive planning uncertainty and organisational performance. These research findings are consistent with the conclusions of Dörner (1996) and Güss (1997) who argue that a willingness to question the environment and its validity are essential cognitive characteristics to ensure plans are appropriately structured for a problem setting. Marshall (1995) also emphasizes the importance of a flexible and uncertain schema when solving complex problems. At present there are two empirical gaps in the literature in respect to planning certainty. (1) There is little understanding of the relationship between decision-makers cognition and

their capabilities for strategic flexibility (Combe and Greenley, 2004). (2) There has been no research on the relationship between the cognitive elements of certainty and organisational performance. This thesis concludes from the literature that planning certainty is negatively associated with effective planning and organisational performance.

Control refers to how an individual attempts to control a problem situation (Güss and Strohschneider, 1996). Individuals are classed as proactive or reactive (Walley, 2004). Proactive individuals actively seek solutions to a problem and are assertive in their approach; a problem does not need to be urgent for these individuals to address it. Reactive individuals only react to a situation when it is necessary, they normally only seek solutions to problems which have a direct impact on themselves. Organisational planning and strategy literature provides a good indication of the influence control has over planning behaviours and performance. Most researchers in this domain have referred Rotter's 'locus of control' model as a basis for their research. Locus of control was initially developed by Rotter in 1966. Rotter (1966) argued that individuals can be classified as either having an internal or external locus of control; "individuals with an internal locus of control believe that the events in their lives are due to uncontrollable forces. Conversely, those who believe in internal control trust in their capacity to influence the environment. Internals believe they can control events in their lives by effort and skill" (Boone and De Brabander, 1993, p.619). There are clear similarities between the locus of control model and the classifications of control applied by this thesis. Proactivity shares common threads with internal control, while reactivity shares similarities with external control.

A review of the literature indicates a positive relationship between internal control and decision making ability and performance. Early studies by Anderson (1977), Miller (1983), Miller, Kets de Vries, and Toulouse (1982) and Miller and Toulouse (1986) investigated the relationship between the locus of control of CEO's and organisational performance. These studies all supported a positive relationship between a CEO with internal control and organisational performance. Miller, Kets de Vries, and Toulouse (1982) also profiled the planning tendencies of internal control CEO's. They conclude

that the task and action-orientation of internal executives, and their ability to deal with stressful situations prompts them to use more planning to manage complex problems (Nwachukwu, 1995). A meta-review of the literature by Boone and De Brabander (1993), found that research in the strategic leadership domain generally concludes that firms led by internal CEO's outperform those led by external CEO's. The authors also reviewed the dispositional nature of locus of control. They conclude that control, within the organisational leadership domain, is a fundamental and enduring personality trait. Meaning a CEO's locus of control will endure across differing tasks, situations and contexts (Boone and De Brabander, 1993). Wang and Chan (1995) conducted a conceptual study of the literature related to locus of control to form propositions regarding strategic information-processing and planning abilities. Their findings are congruent with research by Begley and Boyd (1987), Govindarajan (1989), Gupta (1988), Khan and Manopichetwattana (1989) and Miller (1983), concluding that CEO's with an internal locus of control process complex information and form strategic plans more effectively than those with an external locus of control. This thesis concludes from the literature that proactive planning control is positively associated with effective planning and organisational performance.

Priority relates to the order of consideration and number of problem elements addressed by a decision-maker. Individuals are classed as singular, sequential or simultaneous (Walley, 2004). This is coded using two dichotomous variables, explained in detail in chapter three. These variables code priority based around whether single or multiple elements are used in either serial or parallel consideration of the elements. Individuals who structure their plans in a singular fashion focus on only one problem element and solution (single and serial). Individuals who structure their plans in a sequential fashion focus on multiple problem elements and solutions but in a staged/serial sequence (multiple and serial). Simultaneous individuals consider multiple problem elements and solutions in parallel (multiple and parallel). The importance of prioritising has received some interest in the literature. Most literature is grounded in the domains of finance, accounting, operational management, production scheduling and resource allocation. These studies were only useful as a guide to direction of the literature. A

smaller body of literature, under a variety of research disciplines, has investigated prioritising in organisational management. The general popularity of prioritising in this domain has led to the majority of publications being trade or magazine style. These styles of publication have not been referred to in this thesis. Commonly related disciplines include time management, task organisation, procrastination, leadership, career management, personal development and delegation. The general consensus of the literature is that a positive relationship exists between effective prioritising and organisational and personal performance. An early study by Berg (1974) investigated how individuals allocate and plan resources for projects with uncertain consequences. He concluded that an ability to prioritise was positively associated with appropriate time and resource allocation under situations of uncertain problem solving. Individuals with an ability to prioritise could make decisions faster and more effectively allocate resources to multiple tasks concurrently. A small group of studies have also investigated the direct relationship between prioritising and organisational strategic planning (Mapes, 1980; Miller, Wilson and Hickson, 2004; Pearson, 1989; Raichle, 1980). These studies are limited as they largely use conceptual or anecdotal evidence as a basis for their findings. They argue that an ability to effectively prioritise improves personal and organisational planning processes in respect to cost efficiency, relevance and achievement of goals.

There is no accepted definition for effective prioritising in the literature. Most studies suggest that effective prioritising involves good time management (Atherton, 1986; Pechan, 1997), an ability to focus on important issues (Berg, 1974; Saifullah and Kleiner, 1988), a comprehensive outlook of current and future problems (Raichle, 1980) and a motivation to achieve planned objectives (Mapes, 1980). This thesis' definition of a simultaneous planner fits well with the general profile of an effective prioritiser compiled from the literature. The current literature is limited in its relevance to this thesis. To date studies have normally viewed effective prioritising as an outcome of appropriate planning, not a precursor to it. These studies view prioritising from an applied perspective, assessing prioritising skill around the time taken to generate priority lists (Berg, 1974) or the structuring of tasks into effective sequences (Mapes, 1980) and then relating this to efficiency and productivity changes at a personal or organisational

level. Not surprisingly the vast majority of these studies have argued a positive relationship between effective prioritising and organisational/individual performance. Given these results it is surprising that no researcher has comprehensively investigated the antecedents to effective prioritising. A few studies have mentioned the importance of teaching prioritising skills in leaders and CEO's (Pearson, 1989; Raichle, 1980). Only three studies to date (Güss, 2002; Strohschneider, 2002; Walley, 2004) have considered whether prioritising ability is an inherent cognitive disposition of a decision-maker. Güss (2002) and Strohschneider (2002) reviewed the cross-cultural differences in planning and decision making abilities and behaviour. Their studies involved using the same planning scenario technique adopted by this thesis. Planning responses from various cultures were compared and contrasted around the seven sub-elements discussed in this section. With respect to prioritising they conclude that an ability to prioritise effectively is central to planning and managing complex, uncertain or uncomfortable situations. Given the cultural focus of their research, they did not investigate the reasons for this. This thesis concludes from the literature that simultaneous planning is positively associated with effective planning and organisational performance.

2.4.4 Research related to PO

Section ***2.4.3*** discussed the immediate research related to the individual sub-elements of PO. This section will discuss the literature that has contributed to the development of the general PO construct. The purpose of this section is not to provide comprehensive reviews of the literature, but to use research in these areas to justify and frame PO's inclusion in this thesis. Research related directly to the PO construct, or the cognitive elements of organisational planning, is limited in the literature. Mintzberg (1993), Matthews and Scott (1995) and Gibbons and O'Connor (2005) all make reference to the lack of adequate research related to the antecedents and personal details of the planning process. Some minor references to PO can be found in organisational and cognitive psychology research (for example: Escher, Grabarkiewicz, Frese, Van Steekelenburg, Lauw, Friedrich, 2002), yet in most cases PO is only mentioned in passing. In order to review the theoretical basis for PO it was necessary to review parent

disciplines of organisational planning and cognitive/decision making psychology. This section will discuss the relevant areas of these parent disciplines.

Organisational planning has been extensively researched in the literature with a wide variety of study designs and research goals (Boyd, 1991; French, Kelly and Harrison, 2004; Schwenk and Schrader, 1993). The body of literature related to organisational planning emerged in the early 1960's and has significantly evolved (Rogers, 1981). Traditional planning research typically focused on large organisations and how planning was incorporated into the organisation, whether the presence or absence of planning was linked to success (Aldrich, 1999), who controlled the planning process (Reinharth, Shapiro, and Kallman, 1981; Rogers, 1981) and the predictive capabilities of planning (Roberts, 2004). Gradually the research focus broadened to encompasses domains that include, but are not limited to, small organisations, informal planning, the importance of flexibility and dynamic planning processes and the reasons why or why not organisations choose to implement planning processes (Roberts, 2004). This change has seen a shift from planning being seen as rigid, formal and focused on prediction and forecasting to being flexible, informal and focused on adaptability and contingencies (Dörner, 1996).

Despite this evolution, planning research is still of limited relevance to this thesis. Past and current research usually attempts to relate the application of technical planning processes to some measure of organisational success. Common approaches include considering the absence or presence of planning, if planning is implemented appropriately or how organisational structures are used to create plans. Few studies acknowledge or attempt to understand the direct relationship between an organisational decision-makers' cognitive ability and planning strategy. This is surprising given that researchers often allude to this influence in their discussion, but never move to empirically research any potential relationship. A recent study by Gibbons and O'Connor (2005) further emphasizes the need for research in this area. That study involved investigating the influences on strategic planning processes in 220 Irish small to medium sized enterprises (SME). The research concluded that management approaches

can influence the formal strategic planning process of organisations. This relationship was found to have significant negative effects over performance under certain environmental conditions. This research did not consider the cognitive elements of decision making, instead focusing on managerial experience. Despite the difference in research design to this thesis, the results of this study provide further evidence for the influence senior decision-makers have over the success of SME organisations.

Any trait considered for this research should have some intuitive linkage to organisational success. Organisational planning literature, discussed in this section and section ***2.4.4***, provides justification for the inclusion of PO in this thesis. A number of meta-analytic reviews of organisational planning conclude that the literature indicates a strong positive relationship between appropriate planning and organisational performance (Schwenk and Schrader, 1993). Yet there are still a number of organisations who implement formalised planning processes and experience failure due to poorly conceived plans. There has been minimal research into why this is the case (Mintzberg, 1993). This presents a clear gap in the literature regarding the development of a general understanding of how cognitive planning abilities influence organisational performance and conception of effective plans. This thesis aims to address this gap.

Particular streams of research in cognitive psychology and decision making literature are concerned with understanding how individuals solve and cope with complex and unstructured problems (for example: Dörner, 1996; Dörner and Pfeifer, 1993; Funke, 1991, 2001; March, 1988; Sterman, 1987). These studies typically assert that particular cognitive dispositions are a key driver of decision making behaviours and successful navigation of complex problems. This body of research served as the initial inspiration for the inclusion of planning as a cognitive disposition in this thesis. PO, as defined by this thesis, has not been discussed or investigated in the present literature in respect to performance based measures. However, a number of these studies have alluded to the influence of planning abilities and dispositions over complex problem solving processes (Funke, 1991, 2001; Sternberg and Frensch, 1991; Strohschneider and Güss, 1996, 1998). Dörner (1996) dedicates a chapter (p. 153-183) in his book to discussing how planning

processes influence an individual's ability to solve and cope with complex problems. Throughout the chapter Dörner (1996) provides a number of examples to illustrate the positive relationship between effective planning and performance. The cognitive processes related to planning are also discussed, explaining how individuals narrow problem-sectors, engage in trial and error behaviour, manage complexity and develop causal linkages. Dörners writings on the influence of planning in complex and uncertain problem solving situations provide a good conceptual basis to propose a linkage between cognitive planning dispositions and an individual's ability to effectively manage the complexity of an organisation.

Other studies in this area have made specific reference to the influence of the cognitive elements of planning over decision making behaviour and performance. Strohschneider and Güss (1996, 1998) investigated the cognitive cross-cultural differences in Brazilian and German student's approaches to planning in uncertain situations. These studies concluded that individuals from different cultures apply very different cognitive approaches to planning processes. It was from these studies that the planning scenario assessment technique used in this thesis was developed. Later and concurrent studies by Güss (1997, 2000 and 2002) confirmed the results of early studies and expanded the research by looking at Indian and American cultures. A limitation of these studies is that they were only interested in cross-cultural differences and did not discuss the performance implications of different PO's. Brehmer and Dörner (1995), Dörner and Pfeifer, (1993) and Funke (1991, 2001) used variations of a computer simulated design for their research on cognition and complex problem solving. This research involves observing or measuring dispositional or demographic factors of participants and then investigating any relationship between the factors and performance/behaviour in the simulation. These studies all made reference to the positive influence an individuals' planning ability has over the successful operation of a complex simulation. As these studies were not specifically concerned with the influence of cognitive planning processes they did not test the relationship empirically. However they consistently observed that participants who planned and structured their behaviours in the simulation were more successful than those who applied a more ad-hoc strategy.

These studies provided further evidence for the likely relationship between PO and performance, leading to the development of my Masters research. As discussed later in section ***2.4.6*** my earlier research specifically investigated the relationship between PO and performance in a complex simulation (Walley, 2004). This research argued a positive relationship between particular PO's and performance.

Beyond the complex problem solving research of Dörner, Strohschneider, Funke, Brehmer, Güss and others, there are a number of similar cognitive concepts which have contributed to my development of the PO construct. It is important to note that I am only going to discuss these concepts directly in relation to PO. Therefore large areas of research related to each concept are not discussed in this thesis. The concepts that have contributed to, and justified, my development of the PO construct are schema and mental models. There are a number of other decision theory models that are not discussed here, that while relevant, did not substantially contribute to PO's conception for this thesis. First is schema. Marshall (1995) argues that an individual's schema is a central component of their ability to solve and manage complex problems. Schema is defined as "…a generalized concept underlying objects, situations, events, sequences of events, actions, and sequences of actions" (Marshall, 1995, p.21). Marshall (1995) proposes that schema is important in structuring and organising an individuals understanding and actions regarding certain events or experiences. This is similar to the cognitive process through which PO influences planning ability (Walley, 2004). Marshall (1995) explains that an individual's schema is largely a subconscious cognitive process that is applied to help simplify and manage the interpretation of complex events. This is contrary to planning which is a conscious structuring of variables and actions to achieve a set goal. Marshall (1995) argues that while the development of schema is largely a subconscious cognitive process, it directly acts to influence conscious learning and problem solving. The relevance of Marshall's research is limited as it does not make specific reference to the influence of schema over planning abilities and is not focused on organisational research. However it does provide an explanation of the relationship between cognitive processes and conscious problem solving activities.

Similar to schema is the concept of a mental model. Kenneth Craik originally proposed the idea of a mental model (Craik, 1943). Craik argued that an individual's mental model is the manipulation of a vast variety of internal representations of the external world. Craik described mental models as a 'cognitive filter' which defines the way an individual perceives their external environment, filtering the information used to make decisions. Mental models in effect, structure an individual's reality (Eysenck, 2001). Craik believed that mental models are critical in allowing individuals to simplify an incomprehensibly complicated world. When an individual is confronted with a complex problem solving situation, it is essential that they apply mental models to simplify the complexity to a manageable level. Mental models influence how individuals structure, interpret and solve problem situations (Foster and Kaplan, 2001). The concept of a mental model therefore provides a good indication that cognitive abilities influence how an individual structures and interprets problem situations. Johnson-Laird (1999) argued that an individual's mental models are developed based around heuristic judgments, memories, experiences, expert and adaptive knowledge. This thesis proposes that individuals will develop cognitive mental models of planning based around their past experiences and knowledge. When confronted with complex situations individuals' will apply planning mental models, at a cognitive level, to the development of planning strategies.

2.4.5 PO typologies

Unlike the other independent variables used in this thesis, the PO trait is not assessed using a high/low item scale. Instead PO is assessed by classifying planning behaviour around the seven PO elements discussed in section ***2.4.3***. The generic PO dispositions and behaviours of high and low performers will be summarised. These typologies are based on my earlier research (Walley, 2004).

The following behaviours/dispositions are common for individuals who possess a PO associated with high performance. Individuals with a desirable PO consider a high degree of specific detail when formulating their plans. They are able to process and comprehend a greater degree of complexity and establish more causal linkages between

problem variables. They have a desire to elicit high amounts of information with regards to the problem, and use this to consider the consequences and contingent outcomes of their decisions. This leads to longer planning horizons and more flexible planning strategies. Of greatest importance is their uncertain approach to general planning. These individuals do not perceive the context of a problem to be fixed; instead they question the environment and form new paradigms to assist in comprehension. They are typically proactive and focus on all important, not just urgent, issues. Finally, individuals with a desirable orientation demonstrate a tendency to address multiple tasks simultaneously. From a behavioural perspective, these individuals approach complex-problems with confidence and resilience. They are not discouraged by initial setbacks and perceive the uncertainty and ambiguity of complex situations as a challenge not a threat.

Individuals with a PO associated with low performance demonstrate significantly different planning behaviour/dispositions. They are unable to comprehend or in some cases acknowledge the complexity of a problem situation. Important details are often omitted from planning or dismissed as they are too complex to comprehend. They do not consider the long-term consequences of their actions, or possible contingent options. Their plans will sometimes fail to plot a path forward resulting in a lack of action. The environment and problem are seen to be fixed and existing paradigms are applied even when are inappropriate. Solutions are typically implemented in reaction to environmental feedback with minimal perceived control over the situation. Finally, individuals with a less desirable orientation have an inability to cope with multiple tasks simultaneously, opting to focus on one element of the problem. Behaviourally these individuals approach complex problems with caution and apprehension. They view negative feedback as a direct threat to their ability. Failure is often externalized to be 'someone else's fault' reinforcing a perceived lack of control.

2.4.6 Earlier Research on PO

Preceding this research an earlier study was conducted on the relationship between the dispositional traits of SE and PO and performance in a complex behavioural simulation. The study was in fulfillment of a Masters' degree at the University of

Canterbury, New Zealand. This summary will only focus on the findings related to PO. Forty subjects' participated in the study; 20 students from the University of Canterbury and 20 members of the Christchurch business community in New Zealand. PO was assessed using planning scenario analysis. Results indicated that PO is positively associated with performance in a complex behavioural simulation. The study used a familiar design (Brehmer and Dörner, 1993), aimed at identifying a relationship between certain dispositional traits and performance in a complex behavioural simulation. The research method was as follows. Participants were asked to respond to two planning scenarios that confronted them with complex problem situations (see section ***2.4.8***). They required the participant to structure their time and resources in order to achieve certain outcomes. The participants then operated a complex behavioural computer simulation for a period of 75 minutes. The simulation (SchokoFin, ver.2.13), designed by Dietrich Dörner and his team at the University of Bamberg, Germany, simulates the complexity and dynamism that managers are likely to face in a real organisational setting. The participants needed to make a number of decisions, under enforced time constraints, to ensure the viability and growth of this virtual business. The financial performance over the 12 month simulated period was then correlated to the PO sub-elements expressed by the participants in their response to the planning scenario. A summary of the results follows.

Reliability for the PO measures was assessed using inter-rater reliability. The inter-rater co-efficients were 0.77, 0.79 and 0.84. These values represent the percentage of agreement between the inter-rater coding and the researchers coding. The seven dispositional elements that comprise the PO construct were all statistically correlated to financial performance in the simulation. There were also strong inter-correlations present between the seven PO elements, justifying their grouping as a singular construct. The seven sub-elements of PO were also significantly ($p<0.01$) inter-correlated to SE. The SPSS Pearson's Correlation output is shown in table 2.1. The statistical relationships were also supported by observational data regarding the participants' behaviour during operation of the simulation. There were no covariate effects in respect to age, gender or occupational experience (student versus business manager).

For the reader's reference, a summary of the general behavioural observations for both high and low performers is included. The high performers demonstrated an ability to: (1) comprehend a high degree of complexity and detail, (2) develop a specific yet flexible strategy, (3) prioritise variables simultaneously, (4) disseminate relevant information, (5) actively control their environment, and (6) not approach the problem bound by their existing paradigms, viewing the problem situation as variable and open to question. Conversely, the low performers demonstrated an inability to: (1) comprehend complexity and plan specific actions, (2) consider the consequences of initial actions or acknowledge alternative strategies, (3) consider more than one problem or variable as a priority, (4) actively control their environment allowing the simulation to dictate their behaviour, and (5) question the context of the situation relying solely on established paradigms.

Correlations

		Performance	Certainty	Control	Priority	Planning Elements	Measures	Explorations	Ramifications	Self Efficacy	Achievement Motivation	Gender	Age	Occupation
Performance	Pearson Correlation	1	-.678**	.527**	-.578**	.692**	.580**	.649**	.552**	.911**	.614**	-.020	-.171	-.044
	Sig. (2-tailed)	.	.000	.001	.000	.000	.000	.000	.000	.000	.000	.902	.299	.789
	N	39	39	39	39	39	39	39	39	39	39	39	39	39
Certainty	Pearson Correlation	-.678**	1	-.381*	.636**	-.687**	-.660**	-.582**	-.745**	-.515**	-.283	-.168	.147	.061
	Sig. (2-tailed)	.000	.	.017	.000	.000	.000	.000	.000	.001	.081	.306	.373	.713
	N	39	39	39	39	39	39	39	39	39	39	39	39	39
Control	Pearson Correlation	.527**	-.381*	1	-.498**	.429**	.326*	.442**	.228	.555**	.467**	.042	-.034	.107
	Sig. (2-tailed)	.001	.017	.	.001	.006	.043	.005	.163	.000	.003	.799	.838	.515
	N	39	39	39	39	39	39	39	39	39	39	39	39	39
Priority	Pearson Correlation	-.578**	.636**	-.498**	1	-.603**	-.666**	-.518**	-.506**	-.491**	-.225	-.064	.108	-.014
	Sig. (2-tailed)	.000	.000	.001	.	.000	.000	.001	.001	.001	.168	.700	.512	.933
	N	39	39	39	39	39	39	39	39	39	39	39	39	39
Planning Elements	Pearson Correlation	.692**	-.687**	.429**	-.603**	1	.819**	.800**	.682**	.686**	.341*	.163	-.177	-.040
	Sig. (2-tailed)	.000	.000	.006	.000	.	.000	.000	.000	.000	.034	.323	.282	.811
	N	39	39	39	39	39	39	39	39	39	39	39	39	39
Measures	Pearson Correlation	.580**	-.660**	.326*	-.666**	.819**	1	.715**	.646**	.545**	.235	.037	-.066	.050
	Sig. (2-tailed)	.000	.000	.043	.000	.000	.	.000	.000	.000	.149	.823	.688	.763
	N	39	39	39	39	39	39	39	39	39	39	39	39	39
Explorations	Pearson Correlation	.649**	-.582**	.442**	-.518**	.800**	.715**	1	.591**	.716**	.331*	.150	-.086	.118
	Sig. (2-tailed)	.000	.000	.005	.001	.000	.000	.	.000	.000	.039	.364	.605	.473
	N	39	39	39	39	39	39	39	39	39	39	39	39	39
Ramifications	Pearson Correlation	.552**	-.745**	.228	-.506**	.682**	.646**	.591**	1	.478**	.201	.043	-.199	-.093
	Sig. (2-tailed)	.000	.000	.163	.001	.000	.000	.000	.	.002	.220	.793	.224	.573
	N	39	39	39	39	39	39	39	39	39	39	39	39	39
Self Efficacy	Pearson Correlation	.911**	-.515**	.555**	-.491**	.686**	.545**	.716**	.478**	1	.668**	-.075	-.067	.045
	Sig. (2-tailed)	.000	.001	.000	.001	.000	.000	.000	.002	.	.000	.649	.683	.784
	N	39	39	39	39	39	39	39	39	39	39	39	39	39
Achievement Motivatic	Pearson Correlation	.614**	-.283	.467**	-.225	.341*	.235	.331*	.201	.668**	1	-.050	.249	.171
	Sig. (2-tailed)	.000	.081	.003	.168	.034	.149	.039	.220	.000	.	.763	.126	.297
	N	39	39	39	39	39	39	39	39	39	39	39	39	39
Gender	Pearson Correlation	-.020	-.168	.042	-.064	.163	.037	.150	.043	-.075	-.050	1	-.345*	-.179
	Sig. (2-tailed)	.902	.306	.799	.700	.323	.823	.364	.793	.649	.763	.	.032	.276
	N	39	39	39	39	39	39	39	39	39	39	39	39	39
Age	Pearson Correlation	-.171	.147	-.034	.108	-.177	-.066	-.086	-.199	-.067	.249	-.345*	1	.683**
	Sig. (2-tailed)	.299	.373	.838	.512	.282	.688	.605	.224	.683	.126	.032	.	.000
	N	39	39	39	39	39	39	39	39	39	39	39	39	39
Occupation	Pearson Correlation	-.044	.061	.107	-.014	-.040	.050	.118	-.093	.045	.171	-.179	.683**	1
	Sig. (2-tailed)	.789	.713	.515	.933	.811	.763	.473	.573	.784	.297	.276	.000	.
	N	39	39	39	39	39	39	39	39	39	39	39	39	39

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Table 2.1: SPSS Pearson's Correlations. Source: Walley (2004)

2.4.7 Definition of Planning and PO

Planning is a multi-disciplinary concept with its meaning determined by the relevant domain of research. This thesis will only review planning definitions based in organisational and cognitive psychology research. The concept of planning is extensively discussed in the literature under a number of different contexts. Most studies take its meaning as given and do not provide an explicit definition. Common research areas in organisational planning include strategic planning, decision making, forecasting, tactics, competition, team processes and leadership. There are numerous definitions of planning in the literature, with no generally accepted definition; although the majority of the definitions share common themes. A few examples of organisational planning definitions include: 'a systematic method used by an organisation to anticipate and adapt to expected changes', 'the specific process used to accomplish a task' or 'the process of determining a companies' long-term goals and then identifying the best approach to achieving these goals' (Reinharth, Shapiro, and Kallman, 1981). A fault of 'traditional' organisational planning definitions is that they often fail to explicitly account for contingencies, focusing more on the allocation of resources and achievement of goals. Some definitions of organisational planning are too rigid, emphasizing forecasting and mapping of future behaviours (March, 1988).

In contrast, a cognitive perspective from Dörner (1996, p.153) presents a definition of planning that incorporates the consideration of contingent options "to think through the consequences of certain actions and see whether those actions will bring us closer to our desired goal". This definition is somewhat vague in respect to how available resources are allocated throughout the planning process. Güss (2002) offers a more thorough definition. 'An individual is placed in a given situation; they are equipped with a restricted amount of information and resources, and hopefully have some goals for their desired future state. From this, the individual must determine a course of action that will lead them from their present situation to their desired goals'. In a meta-analysis of theories of intelligence, Das (2004, p.14) defines planning more simply as "a mental process by which the person determines, selects, and uses efficient solutions to problems". He concludes from his analysis that planning is comprised of a number of

key components; problem solving, forming mental representations, impulse control, control of processing and retrieval of knowledge (Das, 2004). Some similar concepts to planning used in cognitive research include cognitive maps (Laszlo, Artigiani, Combs and Csanyi, 1996), schema (Marshall, 1995) and causal mapping (Bryson, Ackerman, Eden and Finn, 2004). When relevant to the definition of this thesis, these terms will also be used to refer to planning processes.

Definitions of planning typically include elements of: (1) prediction or anticipation of future events, (2) systematic structuring of behaviour to prepare for anticipated events, (3) allocation of resources to ensure behaviour can be effectively implemented and (4) a final goal or desired outcome element. Definitions only slightly differ based around (1) the statement of time horizon (short or long term) (Das, 1987), (2) the emphasis placed on predictive forecasting methods (March, 1988; March and Heath, 1994) and (3) the consideration of contingent outcomes (Dörner, 1996). Over the last 30 years, the nature and focus of organisational planning has shifted from the quantitative forecasting of events, to a dynamic approach focusing on the consideration of contingencies. March and Heath (1994) argue that organisational planning was traditionally seen to be synonymous with forecasting, where organisational environments were seen to be simple, stable and predictable (Foster and Kaplan, 2001). Traditional planning approaches had a tendency to forecast one course of action and then structure all activities towards this course (Winter, 1990). Modern developments have shifted from this focus to incorporate the contingencies of planning with less reliance on specified long-term forecasts (Dörner, 1996). Successful planning is now believed to be dynamic and flexible process, adaptive to changing demands and stimulus (Dörner, 1996).

This thesis will adopt a definition of planning that encompasses the key elements of organisational and cognitive definitions. The definition has been developed with an emphasis on a dynamic planning approach, as most survey respondents face uncertain and dynamic problem solving environments in their organisations. This thesis defines planning as ‘the analysis of a problem-situation, through the identification and structuring

of factors related to the problem, then to apply this analysis to the construction of contingent planning scenarios to achieve a set goal'.

The term 'planning orientation' (PO) has been adopted by the literature using two main approaches. One approach uses the term to label whether an individual or organisation has a preference for formal planning; the other approach applies the concept to the description of planning behaviours and techniques (for example: Escher, Grabarkiewicz, Frese, Van Steekelenburg, Lauw, and Friedrich, 2002). This thesis adopts the second approach, using PO as a label for the cognitive dispositional processes that influence individual planning behaviours. A review of the literature indicates there is limited reference or discussion regarding PO. Studies to date use PO as a general label of varied concepts relating to planning or planning tendencies, with no study attempting to define the concept. My Master's thesis (Walley, 2004) built on the definition of Güss (1997, 2002) and used PO to label a collective of cognitive dispositions influencing individual planning processes. Dörner (1996) and Güss (2002) conceptualized that the ability to plan effectively is influenced by a small group of cognitive abilities, but they did not refer to these abilities as PO. These abilities are considered to be largely inherent to an individual, but can be modified with long-term counselling (Hersen, 2004). Escher, Grabarkiewicz, Frese, Van Steekelenburg, Lauw, and Friedrich (2002) also determined that planning strategy moderates the relationship between cognitive ability and entrepreneurial performance, but did not identify elements of PO. Given the lack of a widely accepted definition in the literature, I have chosen to define PO with specific reference to complex problem situations, as individuals do not typically rely on plans to solve simple (computational) problem tasks (Eysenck, 2001). I define PO as a 'collection of dispositional tendencies that are applied by individuals to formulate a plan to manage complex problem situations'.

2.4.8 PO sub-element and scenario examples

This section will provide examples of planning statements common to the desirable and less-desirable PO's discussed in section ***2.4.5***. The following examples are drawn directly from my Masters research (Walley, 2004). This research asked

respondents to respond to two different planning scenarios. The examples below are drawn from participant responses to planning scenario A (PS-A), except for examples of the control sub-element which are drawn from planning scenario B (PS-B). The PO of participants was 93% consistent across the two scenarios (Walley, 2004). This PhD research has opted to use only planning scenario A to reduce participant response time.

PS-A

Imagine you are part of the management of a Christchurch textile company. Currently you are responsible for the restructuring of the company. Your workload is heavy. Demanding meetings are scheduled for the next few days. Tough decisions have to be made. A board meeting is planned for the end of the week and the directors expect tangible results from you. Tonight, shortly before you plan to leave, you receive a call telling you of unexpected problems in the Invercargill Branch. These problems fall into your area of responsibility and require your presence down south urgently. Your secretary has already booked the early morning flight for you.

PS-B

Imagine you work with a small, privately owned company. In the beginning, your personal and working relationship to the owner of this company was very good. But over the last few months, things have changed. Business isn't going as well as before and there are internal difficulties. Above all, the owners' attitude towards you has become distinctly colder and even somewhat hostile. This situation makes you feel more and more uneasy. One night while discussing the situation with your spouse, he/she urges you to finally do something.

Examples of high and low complexity and specificity planning statement are shown below. The notation (PE) represents an element of complexity; (-m) represents a specific complexity element.

High

I would ask my secretary to start prioritizing the information I am receiving for what is important to the immediate tasks (PE-m), and ask her to run interference for some of the smaller, less important items (PE-m). If there is someone who can assist me or assume some of my tasks I would bring them in (PE). If my presence is indeed needed in Invercargill I would travel there to fix the immediate problem (PE-m), or if not provide a

temporary solution from Christchurch to allow time for the board meeting (PE-m). Excessive time would not be spent in Invercargill (PE), and once back I would check the currently scheduled meetings to see if any could be postponed (PE).

Low

I would have to go to Invercargill (PE-m) and try to sort out the problems as quickly as possible. I would then return to Christchurch (PE-m) and try to address any of the issues that related to the restructuring meeting.

Examples of high and low depth planning statements are shown below. Depth was measured by the number of explorations aimed at moving the plan forward or eliciting information to assist in actions. The high depth scenario has five explorations; the low depth scenario has two.

High

Write down what I see is the problem and what I see as the owner's problem. Put myself in his/her shoes and see what options he/she has- what he/she wants to achieve. Attempt to identify common ground, areas of conflict, areas where compromise is achievable. Determine possible strategies to resolve issues; meet and confirm problem. Confirm my analysis. Explore areas of disagreement to attempt to find a resolution. Push the positives compromise on issues of low importance to win on those of importance. If a compromise is not possible come to some workable solution, prepare exit strategy. Leave once alternate position found or position becomes untenable.

Low

Find a whiteboard and a quiet place - note down all the issues and rate them in terms of importance, urgency, timing issues and potential to be delegated. Consider who should be included and if necessary bring them in to assist with the planning or proceed by myself, whichever was most appropriate. Re-arrange in a prioritized order and begin to form a plan of action - who is responsible for what and by when - ask who I should communicate with and communicate the plan - brainstorm weaknesses with the group before implementing.

Examples of high and low width planning statements are shown below. Width was measured by the number of contingent statements. These are normally identified

with *if* and *or* statements. The high width scenario has one contingency; the low width scenario has zero.

High

One: Confirm if I am really needed in Invercargill, if so then to point two, if not three. *Two:* Establish what needs to be done in Christchurch and who is going to do it, check back to see it is happening. Stay in contact with Invercargill, and check how the situation is progressing? *Three:* Confirm what is needed in Invercargill and who is going to do it, check back to see if it is happening. Travel to Invercargill and resolve issues as required.

Low

Arrange meeting with supervisors in Invercargill to assess, unexpected problems. See if meeting required with other members to delve into what the issues are. Assess recommend and follow up a plan of action. May require return visit or email contact with management to ensure smooth running.

Examples of certain and uncertain planning statements are shown below. In most participants uncertainty was identified by the individual questioning whether immediate travel to Invercargill was necessary, and if alternative arrangements were possible.

Certain

Delegate any work that can be done by others while away to minimise workload when returning to Christchurch branch. Reschedule meetings and other important dates for later during week. Resolve Invercargill branch problems and find underlying cause so these problems to do not occur again. On returning to Christchurch, prepare for board meeting.

Uncertain

I would call Invercargill and assess the actual extent of the problems. I would then decide if Invercargill is as urgent as stated. If it is urgent I would travel to Invercargill. If it is not urgent I would cancel the trip and stay in Christchurch and deal with the restructuring meetings. If I did go to Invercargill I would try to get back to Christchurch as quickly as possible and attend what meetings I could. If I stayed in Christchurch I would make sure that Invercargill was aware that I knew of the problems, I would assist over the phone if possible and would travel to Invercargill after the meetings in Christchurch if required.

Examples of proactive and reactive planning statements are shown below. Proactivity was normally identified by individuals addressing non-urgent issues or problems not of direct consequence to themselves (for example: business decline).

Proactive

There are two things going on: business problems as well as interpersonal problems, whereby these can have inter-relationships. Therefore, it would be wise to communicate these subjects as avoiding to speak about it does not delete the problems. I would tell my boss my observations (and ask for his impressions): business is not going so well, I have the impression he is dissatisfied/angry with me. Then I would ask why this is: do we already know what caused the business problems? Would we need to have a team meeting to analyse the situation and identify the causes of the problems? Why is my boss dissatisfied/angry with me does he believe that he is angry with me, or am I misreading the situation? Gaining feedback to my behaviour (have I done anything which annoyed him have I not done the right thing/ Possibility for clarifying misunderstanding). Come up with solutions together with my boss: what can we do to re-establish a relationship of trust and respect? What can we do to solve the business problems?

Reactive

Sit down and talk to the owners about what they feel is the issue, do they see it the same as I do. Is there really an issue? If so investigate why, if not try to find out why my feelings are as they are. Given the issue can be identified try to get a plan to address the matter. Agree to review at some point to further reinforce the solution or better identify the problem / issue.

Examples of simultaneous, sequential and singular planning statements are shown below. The differences in this sub-element were determined by the order that the participant addressed the Invercargill and Christchurch problems. In the case of singular orientations only one problem was addressed.

Simultaneous

Call Invercargill and ascertain the precise nature and urgency of the problem. If the problem is in fact urgent and critical I would travel to Invercargill and address the problems as required. If the problem was not urgent I would stay in Christchurch, resolve the restructuring problems. If I did stay in Christchurch I would keep in contact with

Invercargill to ensure that the problem did not worsen. After the restructuring meetings I would travel to Invercargill if required.

Sequential

I would call Invercargill and find out the precise nature of the problems so I could consider the issues surrounding the problem prior to leaving. I would give my apologies to those involved in the meetings in Christchurch. I would then travel to Invercargill and sort the problems, leaving a plant supervisor in charge of supervision. After sorting the problems I would return to Christchurch and would review the minutes of the meetings I had missed taken by my secretary. I would attend meetings or take part in any tasks still required for the restructuring. I would then call Invercargill to make sure that there are no issues with the implementation of my solutions.

Singular

I would initiate messages to all interested parties in Christchurch where I was going and why and when I would return. I would instruct my secretary to touch base with them during the day and ensure that I received any critical information while down South. I would return later that day after looking at the situation in Invercargill, if at all possible. I should not have to give them more than general instructions and could continue to deal with it from a distance, having seen the problem.

2.4.9 Gaps in the literature

PO is an emergent concept in the literature and to date minimal research has investigated its impact on organisational decision making processes. PO is not clearly defined by the literature. Moving outside of the term 'PO' there has been some research on the cognitive aspects of planning. However, no studies have investigated the relationship between planning cognition and organisational performance. The present planning literature indicates that appropriate planning is related to improved organisational performance. Studies focused on the cognitive aspects of planning have also found that particular dispositions result in more successful planning behaviours. To date there has been no research that has bridged these two conclusions and considered the relationship between PO as cognitive trait and organisational performance. The only studies that have investigated the impact of PO as a dispositional construct, focused on its influence over cross-cultural decision making differences. Organisational planning

research has given some consideration to the effects of particular PO sub-elements. These studies have a number of limitations in respect to this thesis. First, they normally focus on planning at a procedural level in respect to both individuals and organisations. Second, the sub-elements are acknowledged as outcomes of planning behaviours and not as dispositional precursors to planning. Third, the sub-elements are either considered in isolation or as a minor element of a composite construct. Finally, these studies largely focus on planning behaviour under the environmental context of the respondent. No relationship has been established between PO and AT, SE or RES.

2.4.10 Hypotheses

Both organisational and psychology literature related to planning indicate a positive relationship between effective planning and performance. Unlike the other three psychological attributes the relationship between PO and performance has only been hypothesised directly, as planning intuitively has a direct link to organisational financial performance. As a cognitive disposition this relationship has only seen limited attention in the literature. Relevant studies to date have found that particular PO's or approaches are preferable. With reference to the seven sub-components of PO a preferable orientation can be profiled as an individual who incorporates (1) high complexity, (2) high specificity, (3) high depth, (4) high width, (5) uncertainty, (6) proactivity and (7) simultaneous prioritising into their planning strategy. Hypothesis H^{3SE} addresses the relationship between SE and PO in section ***2.2.9***. The following hypotheses relate to PO:

> *H^{1PO}: The complexity and specificity of planning of organisational decision makers will be positively associated with firm financial performance.*

> *H^{2PO}: The depth and width of planning of organisational decision makers will be positively associated with firm financial performance.*

> *H^{3PO}: Increased planning certainty by organisational decision makers will be negatively associated with firm financial performance.*

> *H^{4PO}: Increased control in planning by organisational decision makers will be positively associated with firm financial performance.*

H^{5PO}: Increased simultaneity in planning by organisational decision makers will be positively associated with firm financial performance.

2.5 Hypothesised Model

Based around the hypotheses stated in this chapter, two models have been created to represent these relationships. These models will be tested against the final data set using structural equation modeling. Results are discussed in chapters four and five. The first (figure 7) models a direct relationship between AT, SE, RES and performance (indicated by the arrow between the latent variables of Psych Attributes and Performance). The second (figure 8) models a moderating relationship between AT, SE, RES and performance. Two differing models are proposed as the literature indicates the potential for either a direct or moderating relationship between AT, SE, RES and performance. Analysis in chapter four explains the reason for Figure 8 being selected as a superior model.

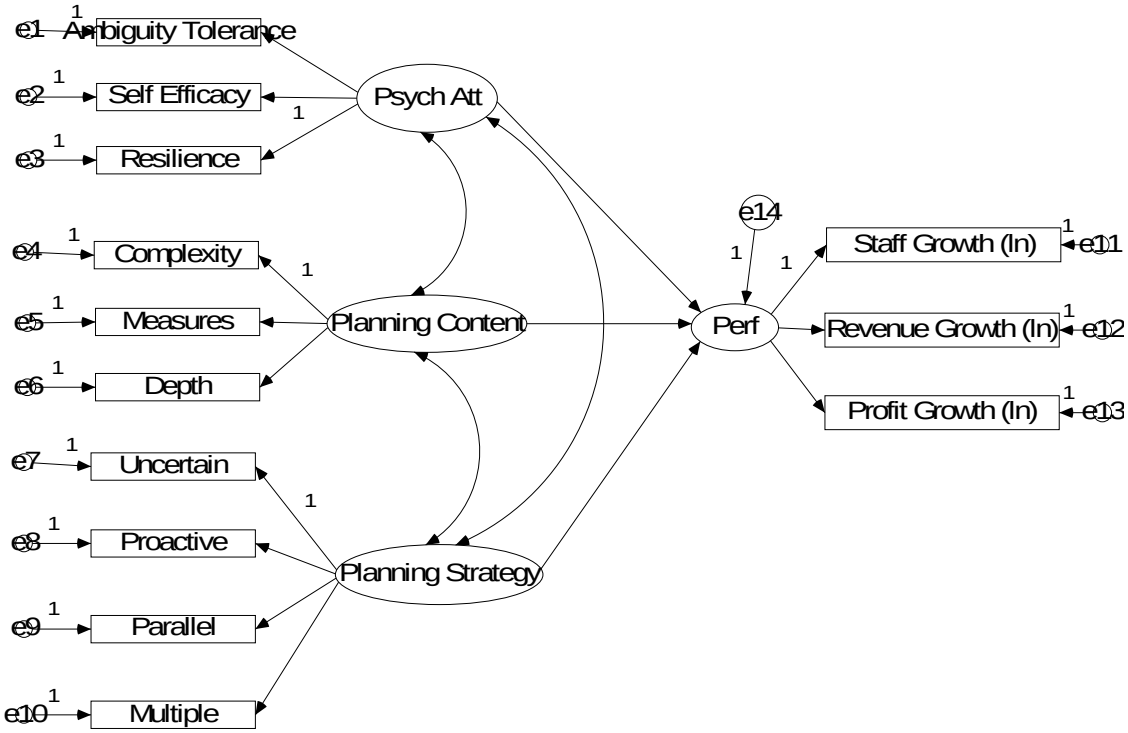


Figure 7: Hypothesised Model (Direct)

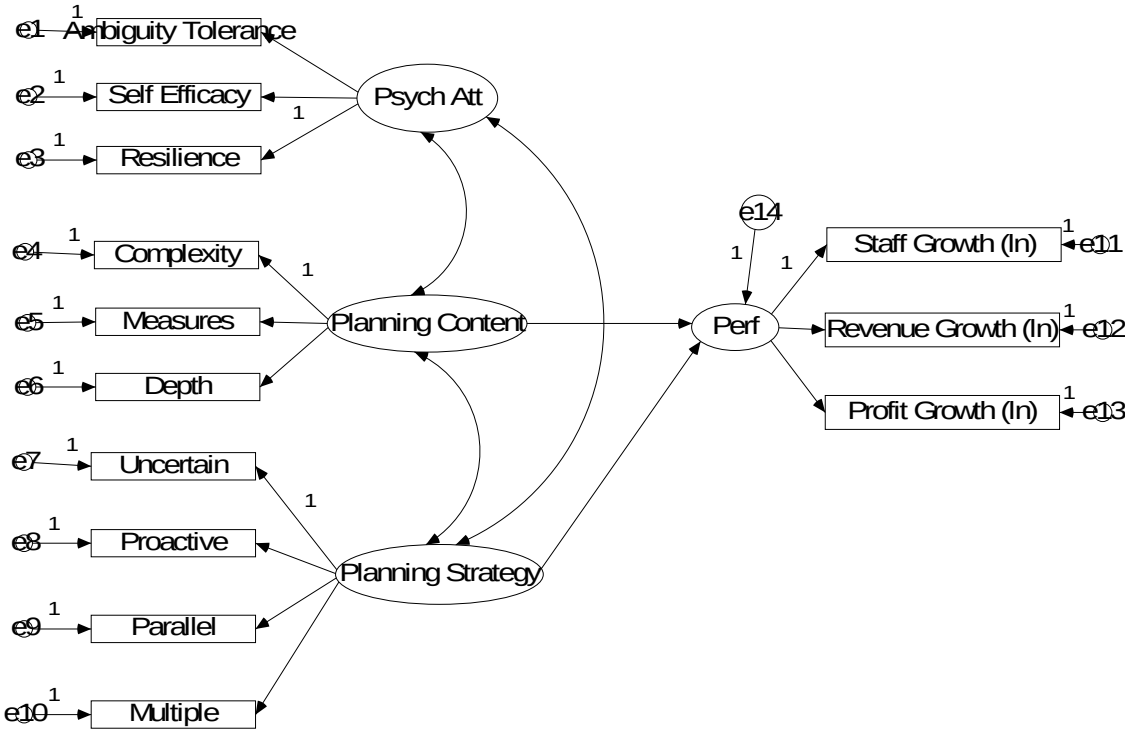


Figure 8: Hypothesised Model (Moderating)

Chapter Three

- Methodology

3.0 Methodology

This chapter provides a comprehensive review of the research methodology. (1) The design and selection of the study instrument and how individual attribute scales are grounded in existing literature is justified. (2) The unit of analysis is specifically defined to frame the population of interest. (3) A detailed chronology is presented of how and when the survey instruments were administered. (4) Any limitations in the methodology are identified and rationalised and the coding process of the dependent measures is detailed. (5) The structural equation modeling techniques selected for data analysis are detailed and justified.

This study applies a deductive research design to investigate the relationship between selected psychological attributes of owner managers over organisational performance in small to medium sized enterprises (SME's). The psychological attributes of interest are ambiguity tolerance (AT), self efficacy (SE), resilience (RES) and planning orientation (PO). A deductive design was appropriate given the high level of development and understanding of the independent variables in the existing literature (Cavana, Delahaye and Sekaran, 2001) and the researches focus on causal relationships. A quantitative research design was employed. This design was delivered through the use of a mail-based survey comprising of select response item scales, an open-ended scenario response and a series of closed questions relating to organisational performance. This data was analysed using structural equation modeling.

3.1 Study Instrument

The survey instrument (Appendix A) comprises of three item subscales, one open ended scenario question, five demographic questions and three questions in relation to organisational performance. The following sections discuss the rationale for selection of the subscales and other questions.

3.1.1 Measurement of the AT construct

Various instruments are available to measure AT. These instruments involve the participant either responding to a scale of self report items (MacDonald, 1970), or

completing a cognitive or perceptual test. The latter style of tests have been largely discredited due to their low internal validity and inter-correlations with other measures such as authoritarianism, risk taking and dogmatism, which have well documented correlations to AT (Bochner, 1965). Due to higher internal reliability and strong inter-correlations with other measures, self-report item scales are widely accepted in AT research (Furnham and Ribchester, 1995). There are four widely used self report item scales in AT research: (a) Budner's (1962) Tolerance-Intolerance Ambiguity Scale, (b) Rydell and Rosen's, Ambiguity Tolerance Scale (1966), (c) MacDonald's (1970) AT-20 Scale, and (d) McLean's (1993) MSTAT-1 Scale. Other scales have also been developed by Walk (O'Connor, 1952), Lorsch and Morse (1974), Norton (1975) and Bhusha and Amal (1986). These scales have low internal reliability and a large number of extraneous items (Lange and Houran, 1998). The Big Five Personality Inventory does not have a precise instrument for AT. The most suitable scale 'openness to experience' from the NEO Five Factor Inventory (Costa and McRae, 1992) includes items more closely related to creativity and not decision making, making it unsuitable for this research. Judge, Thoresen, Pucik and Welbourne (1999) report an inter-correlation of 0.65 between openness to experience and AT.

Budner's (1962) instrument was the first widely accepted and validated scale for assessing AT. A review of the literature indicates Budner's scale appears to be the most widely used; this is mostly due to its early inception. Budner's scale consists of 16 items and has an alpha of 0.59. Rydell-Rosen's (1966) instrument was developed directly from Budner's scale and consists of 16 items with an alpha of 0.64. MacDonald's (1970) scale (AT-20) is a revised version of Rydell-Rosen's scale with two additional items from the California Inventory Scale (Gough, 1957) and two items from Barron's Conformity Scale (Barron, 1953). The AT-20 scale consists of 20 items and has reported alpha values of between 0.79 and 0.84. Lange and Houran (1999) also analyzed the AT-20 scale for item response using Rasch modeling. This analysis concluded that the AT-20 has very good item reliability of 0.93, with only two items being considered slightly incongruent with the overall scale. McLain's (1993) MSTAT-1 scale consists of 22 items and an alpha of 0.86, but has a low convergent reliability with the AT-20 (0.58) and Budner's scale

(0.37). In respect to instrument selection for this thesis; the Budner and Rydell-Rosen scales were rejected due to low alpha scores. The Norton (1975) scale, despite an alpha of 0.89, has 69 items making it too impractical for data collection. The MSTAT-1 scale was considered suitable for this research, but is not widely supported in the literature. Therefore MacDonald's AT-20 scale (1970) was employed for this study; supported by a good general use in the literature, acceptable alpha values and more thorough test analysis and validation (Lange and Houran, 1998). The AT-20 scale requires the participants to respond using true/false statements to indicate whether they agree or disagree with each particular item statement. These are listed in section ***3.5*** of this chapter.

3.1.2 Measurement of the SE construct

Bandura (2001) has written a guide for the development of SE scales. In this guide he explains that there is no general all-purpose measure for SE. This is largely due to the domain specific nature of SE. Bandura (2001, p. 1) states "that the one measure fits all approach has limited explanatory and predictive value because the items in the all purpose test will have little or no relevance to the domain of functioning in the research". Scales that relate to a particular domain of functioning must therefore be tailored to the particular domain of interest to the research. These arguments are widely accepted in the literature with the majority of SE scales adopting an SSE orientation. Even the majority of GSE scales focus on general areas such as complex or structured problem solving, motivation, learning etc. Given this, the majority of researchers choose to develop and validate their own scales of SE specifically for their research (Bandura, 2001; Pajares, Hartley and Valiante, 2001). Consequently, there are numerous scale-based measurements for SE in the literature. Few measures, outside of health and education related studies, have gained adequate acceptance to be widely used by other researchers.

Bandura (2001) provides some guidance for selecting appropriate scale items when developing SE measures: (1) efficacy items must accurately reflect the domain of interest, (2) items must assess present, not expected future, efficacy, (3) all items must relate to general functioning in the domain of interest, (4) scale items must provide a

large interval-scale, (5) confidentiality must be assured and (6) the scale must not be identified as a SE measurement to the participant. In consideration of these factors four scales were considered for this thesis; (a) Schwarzer and Jerusalem's (1995) GSE scale, (b) Sherer and Adams (1983) SGSE scale, (c) Chen, Gully and Eden's (2001) NGSE scale, and (d) Costa and McRae's (1992) NEO-C1 scale. Schwarzer and Jerusalem's (1995) GSE scale consists of ten items and has reported alpha values between .70 and .90 in 23 countries demonstrating good cross-cultural reliability. Sherer and Adams (1983) SGSE scale consists of 17 items and has a reported alpha between .76 to .89. Chen, Gully and Eden's (2001) NGSE scale was developed directly from Sherer and Adams (1983) SGSE scale and consists of eight items with a reported alpha of .86 to .90. Costa and McRae's (1992) NEO-C1 scale is a component of the five-factor personality inventory and consists of ten items with reported alphas between .78 and .92. For this thesis, all scales were considered suitable in respect to domain specificity. All scale items were similar and focused on general complex problem solving functions and motivations. Also all scales have acceptable alpha scores (Nunnally, 1978). Schwarzer and Jerusalem's (1995) GSE scale was rejected due to an inadequate interval-scale of four (Pajares, Hartley and Valiante, 2001). The Sherer and Adams (1983) SGSE and Chen, Gully and Eden NGSE scales were rejected due to the somewhat verbose or ambiguous wording of the item scales. Costa and McRae's (1992) NEO-C1 scale was, therefore, selected for use in this thesis; supported by relevant items, acceptable alpha values and appropriately worded items. This scale has been used in earlier research by the thesis author with a reported alpha of .92 (Walley, 2004). The NEO-C1 scale can be administered using both five and seven point likert scales. A seven point likert scale was used to allow for more variation in the sample (Muchinsky, 1997).

3.1.3 Measurement of the RES construct

Connor and Davidson (2003) conducted a general review of the literature related to scale based RES measures. They found a large degree of variation in the literature with most researchers developing new, or tailoring existing, scales for their research. As a consequence no single scale based measure is used widely across different domains or accepted in the literature (Connor and Davidson, 2003). This is highlighted by the

American Psychiatric Association not publishing a RES scale in their Textbook of Psychiatric Measures (American Psychiatric Association, 2000). The variation of scale based measures of RES is largely attributed to: (1) the lack of a widely accepted definition of RES (Friborg, Martinussen, and Rosenvinge, 2005), (2) large differences between the characteristics of research domains (Campbell-Sills, Cohan and Stein, in press), and (3) close similarity to constructs of coping, tolerance, hardiness and vulnerability, introducing other scales for consideration (Campbell-Sills, Cohan and Stein, in press). With respect to scale choice for this thesis, four selection criteria were put in place: the scale must, (1) have good internal consistency, test-retest reliability and validity, (2) have a moderate number of items for efficient administration, (3) have been applied in a variety of research domains, and (4) have items that accurately reflect the problem solving domain of interest.

In consideration of these factors, six scales were considered for this thesis; (a) Bartone, Ursano, Wright and Ingraham's (1989) DRS scale, (b) Connor and Davidson's (2003) CD-RISC scale, (c) Maddi and Khoshaba's (2001) HardiSurvey III-R, (d) Costa and McRae's (1992) NEO-N6 scale, (e) Friborg, Hjemdal, Rosenvinge, and Martinussen's (2003) RSA scale, and (f) Endler and Parker's (1999) CISS-SF scale. Bartone, Ursano, Wright and Ingraham's DRS scale consists of 45 items with reported alpha of .68 to .80 and is based on three subscales of control, commitment and challenge. This scale was developed to assess the impact of a military air disaster on the health of assistance workers. Connor and Davidson's CD-RISC scale consists of 25 items and has a reported alpha of .89. This scale was developed to be a general scale of RES in adult populations with a bias towards coping with stress and adversity. Maddi and Khoshaba's HardiSurvey III-R consists of 65 items and has a reported alpha of .82 to .89. The scale focuses on the control, commitment and challenge elements of hardiness. Costa and McRae's NEO-N6 scale is a component of the five-factor personality inventory and consists of ten items with a reported alpha of .82. This scale is used to measure vulnerability, but has been negatively keyed (reverse scores) for RES and emphasizes coping with, and recovery from adversity. Friborg, Hjemdal, Rosenvinge, and Martinussen's RSA scale consists of 37 items and has a reported alpha of .80. The scale

measures five factors of RES: (1) personal competence, (2) social competence, (3) family coherence, (4) social support and, (5) personal structure. Endler and Parker's CISS-SF scale consists of 21 items and has a reported alpha of .78 to .84. This scale focuses on task, emotion and avoidance orientations when coping with stressful situations.

For this thesis, Friborg, Hjemdal, Rosenvinge, and Martinussen's RSA (2003) scale, Maddi and Khoshaba's HardiSurvey III-R (2001) and Bartone, Ursano, Wright and Ingraham's DRS scale (1989) were all rejected due to their larger number of items making them impractical for data collection. Endler and Parker's (1999) CISS-SF scale was rejected due to seven of the items focusing on the emotional aspects of stress coping. This was considered outside of the domain of this thesis. Connor and Davidson's (2003) CD-RISC scale was considered to be a good option for this thesis in respect to validity, reliability and general use in the literature. However, it was rejected due to its length relative to Costa and McRae's NEO-N6, and the similar alpha values between the two scales. Costa and McRae's (1992) NEO-N6 scale was therefore selected for use in this thesis; supported by efficient administration, acceptable alpha values and appropriate items for the domain of interest. The NEO-N6 scale can be administered using both five and seven point likert scales. A seven point likert scale was used to allow for more variation in the sample (Muchinsky, 1997).

3.1.4 Measurement of the PO construct

This review is largely developed from my earlier masters' thesis. The choice of assessment measure was therefore determined largely by the success of the planning scenarios used in my masters thesis (Walley, 2004). This review has been updated to include recent developments. The literature offers a wide variety of tests for assessing planning. Tests are generally domain specific, often developed and used for a particular research project. Planning is assessed from either a person or task orientated approach. Task orientated approaches focus on the mechanics or process of planning. Person orientated approaches focus on the intelligence and behavioural elements of planning. Organisational planning literature presents a number of methods for assessing planning strategy and individual planning in an organisation. These measures largely focus on

assessing the tasks or mechanics of planning approaches. For example, how was the plan formed? Who contributed to the planning process? What is the time horizon for the plan? The limited application of these tests usually results in them being impractical for future research, having poor reliability and validity or being developed solely for commercial purposes. Some general purpose tests are published in The Mental Measurements Yearbook (Buros, 1992) and include, Educational Administrator Effectiveness Profile (EAEP), Leadership Skills Inventory (LSI), Management Appraisal Survey (MAS), Management Styles Questionnaire (MSQ) and Problem Management Survey (PMS). A comprehensive critique of these measures can be found in Buros (1992); this thesis will only review the reasons why these measures were deemed unsuitable for this research. The EAEP test was not used in this thesis due to its impracticality for research having 120 items. The LSI only loosely assessed planning as a sub-component of leadership and has been criticized for being too subjective (Kerr, 1989). The MAS has no empirically reported reliability or validity and no administration guidelines. The MSQ has no reported validity and is largely focused on task-orientation. The PMS has no empirical support in the literature and takes considerable time to administer, making it impractical for the data collection method used in this research. A review of the organisation planning literature indicates that the problems above plague the majority of published tests in the domain.

Planning can also be assessed using person-oriented intelligence and behavioural tests. These tests are frequently used in developmental, personality, behavioural and cognitive psychology research. Similar to organisational planning research there is a wide variety of tests in use, all of varying quality and practicality. Intelligence based tests like the Tower of Hanoi Task, PASS Theory of Intelligence (Das, 2004) or Das-Naglieri Cognitive Assessment System (Naglieri, 1999) provide established, reliable and valid approaches to assessing cognitive planning ability (Hersen, 2004). However, these methods fail to capture the spectrum of planning sub-elements and decision making tendencies required for this research. In order to assess PO adequately for this thesis it was necessary to find an instrument that effectively assessed planning behaviour. A planning scenario analysis technique developed by Strohschneider and Güss (1996) was

selected. This technique offers a number of advantages. First, it assesses PO to a level of detail required by this thesis. Second, it has been validated in earlier studies by Güss (1997, 2002) and Strohschneider and Güss (1996, 1998). Third, it can be easily self-administered by the respondent. Fourth, it is relatively time efficient to complete at less than ten minutes, when compared to other planning measurements.

3.1.5 Demographic Information

This subsection consisted of five questions which collected nominal and interval data about the respondents' identity, gender, experience, number of businesses owned/operated and contact details. This section was optional. Identity was only established to allow follow up interviews with a proportion of the sample. Gender, experience and number of businesses owned/operated were collected solely for use as a covariate in later regression analysis.

3.1.6 Organisational Performance

This study has opted to assess organisational performance solely by using common financial performance measures. The three financial performance measures are profit, revenue and staff growth over a four year period. These measures were selected as they are (1) common measures of financial performance reported in the literature; (2) easy for respondents to obtain for completing the questionnaire and (3) prima facie the best indicators of financial performance. A four year period was used as it is (1) adequate to indicate a growth trend; (2) a short enough period that performance data would be readily available and (3) recent enough that most respondents would have been operating the organisation for the entire period (as this was a requirement of participation). Clearly this has limitations as some organisations do not operate primarily for financial reasons. The choice to operate a SME can often be a lifestyle choice on the part of the individual with no long-term aspirations for growth. On reviewing the data collected for this research there were only 18 organisations (4.6% of the sample) that reported a growth percentage of less than 5%. The majority of organisations were therefore experiencing some degree of growth or decline in the three major financial performance indicators used in this study. Another limitation may have been the time scale of the data being

collected with some respondents not operating organisations for the entire four year period. All respondents provided complete data, suggesting that this was not an issue in the respondent sample. This may have contributed to non-response rates. Finally, organisations that operate on a not for profit (NFP) basis were excluded from the research; this limits the unit of analysis and the external validity to organisations with NFP orientation.

3.2 Unit of analysis

The population of interest for this thesis are owner/operators of New Zealand SME's. This population was selected for a number of reasons. First, the majority of research participants were drawn from the New Zealand business community and 96.4% of New Zealand businesses are classified as SME's (Statistics New Zealand, 2006). Second, the owner operators of SME's are more likely to be involved in the daily operation of the organisation. The influence of their personal decision making attributes over organisational performance is therefore expected to be more substantial. Finally, any findings or benefits of this research are expected to be applied in New Zealand enterprises and focusing the population of interest on SME's ensures this research is targeted towards its intended audience.

The sampling frame selected for the primary sample in this research was the 2004 New Zealand Business Who's Who (NZBWW) (FEP Publications, 2004). This guide was used as it lists over 20,000 New Zealand organisations from all industries and geographic locations. Five thousand companies were randomly selected from the guide. Weightings were assigned to the major geographic locations in New Zealand based around their population to ensure a representative geographic spread was obtained. Some organisations were deemed to be inappropriate given the study population. These organisations included legal/accountancy firms and partnerships, state owned enterprises, not for profit organisations and large multi-national and local corporations (over 80 employees). If selected these organisations were removed from the sample and a new organisation was selected. Some owner/operators were also responsible for multiple

organisations, only one survey was sent and it was requested that performance data entered related to their largest/primary interest.

A sample size of 386 was obtained across all sample frames. A pilot study was conducted which had a sample size of 32. Given that most variables are not dichotomous being either multi-category (PO) or assessed using likert scales (AT, SE and RES) a power analysis is not appropriate (Miles, 2003). Roscoe (1975) suggests a series of general rules in determining acceptable sample sizes for research. He proposes that for any research intending on conducting multiple regression analysis, a sample size 10 times that of the number of variables must be obtained. A review of the general literature related to regression-based psychology research indicates this rule is generally accepted. This study considers four primary independent variables and three covariates. The PO independent variable is composite construct with seven sub-components. The total variables used for analysis is therefore 13, giving a recommended minimum sample of 130 (Roscoe, 1975). A sample of 386 is considered adequate for the purposes of this study.

3.2.1 Pilot Study

The research questionnaire was piloted on 32 organisations. The purpose of this pilot was to assess the readability, content and obtain general feedback on the layout of the questionnaire. General feedback indicated no major changes were necessary. Two grammatical errors were identified and corrected. The wording of the introductory letter was also modified as a result of participant feedback. Five of the participants did not notice the open-ended scenario question due to it being duplex printed on the back of the introductory letter. This was also corrected for the main survey. Some participants suggested changing the performance data dates to be more recent ranging from 2001-2004 instead of 2000-2003. It was decided not to change to a later date range as it would be likely that some companies would not have finalised accounts for the 2004 period. Finally, there was some criticism of the face validity of some of the items in AT scale (items 12, 13, 14 and 20). It was decided not to remove these items on the grounds of

face validity, due to the general acceptance of the AT-20 scale in literature. There was general consensus that the questionnaire was well set out and easy to read.

3.2.2 Internal and external validity of measures

Section ***3.1.6*** details the reasons for using financial performance measures to measure organisational growth. As this data is actual performance data for each organisation over a four year period, the findings of this research will have good external validity. This validity is of course limited to the unit of analysis of this study and subject to the limitations discussed later in this chapter.

Section ***3.1*** discussed the development of the survey instrument. With respect to internal validity, the study instrument utilises established scales and questions which have very good levels of reliability and validity in the literature. These scales demonstrate robustness with consistently high alpha values across different streams of literature. The only element of study instrument that is not well established is the open-ended planning scenario. However, as discussed in section ***3.1.4***, this technique has been shown to be reliable in other studies (Güss, 1997, 2002; Strohschneider and Güss, 1996, 1998; Walley, 2004). Demographic and performance data is actual data and is therefore likely to be accurate. The survey instrument should therefore have very good internal validity.

3.3 Administration of instruments

The pilot study was completed throughout January 2005. The survey was administered via mail from the period of August 2005 through February 2006 (Appendix A). The survey was distributed in three phases. The first phase was sent on the 1st of July 2005 with a response date of 15th July 2005. This phase involved sending out 2500 surveys. The second phase was sent on the 1st of September 2005 with a response date of 16th September 2005. This phase involved sending 1000 surveys. The final phase was sent on the 29th of January 2006 with a response date of 17th February 2006.

All surveys were mailed via the University of Canterbury on Department of Management letterhead. Return post-paid envelopes were included with each survey

addressed directly to the researcher. Surveys were addressed to the postal address of each company as listed in the New Zealand Business Who's Who directory. All surveys were sent attention to the CEO or owner/operator of the organisation.

The surveys requested respondents to return completed surveys within two weeks of receipt. This deadline was set to ensure that respondents applied some urgency to completing the survey but were not placed under heavy time pressure. A cover letter was attached to the survey detailing the purpose of the research, funding interests and supervision arrangements. Full contact details for the researcher and thesis supervisor were supplied. Copies of the survey are included in Appendix A.

The response rates varied throughout the sample. The pilot study was sent to 152 companies with 32 respondents (response rate 21.1%). The mail surveys in New Zealand were sent to 4500 companies with 795 being returned due to incorrect mailing addresses or company closures, a total received sample of 3705 with 386 respondents (response rate 10.4%).

The low response rate to the survey was expected given the nature of the respondents being sent unsolicited questionnaires and the absence of any incentive for completing the survey. The survey was also relatively long at five pages requiring approximately a 15 minute time commitment. With a high non-response rate of 89.8% it is important to consider any potential non-response biases. Armstrong and Overton (1977) suggest a number of possible methods for identifying and minimising non-response bias. (1) Make a subjective estimate of the bias based around an understanding of the items and the population. (2) Extrapolate that non-respondents share similar characteristics to late respondents. (3) When data-collection is conducted in waves, differences between the waves can be compared to determine the magnitude of any likely biases and whether extrapolation for non-response bias is necessary. (4) Follow up with a subgroup of non-respondents to measure any differences between their group and the sample. This method is not suitable given that approximately half of all respondents opted to remain anonymous. Adopting the approach one, as suggested by Armstrong and

Overton (1977), basic descriptive statistics were run on early and late respondents in the three mail surveys. Across all three surveys, there was no significant variation in both the independent and dependent variables between early and late respondents. ANOVA tests confirmed no difference between groups. It is concluded there was no significant non-response bias in the sample and that the sample is representative of the unit of analysis.

3.4 Limitations of the methodology

The sampling frame used for the study has a number of inherent limitations. (1) The NZBWW is not a comprehensive list of New Zealand organisations, but was used for its ease of access and wide demographic spread of organisations. (2) The database is only updated annually leading to a number of respondents surveys being 'returned to sender' lowering the overall response rate. (3) The length of the questionnaire was also a potential limitation in restricting the overall sample size. Taking approximately ten to 15 minutes to complete, some respondents returned the questionnaire stating it would take too much time. This may have contributed to the lower response rates. Outside of the direct limitations of the methodology, the quantitative nature of this also presents a number of limitations. These are detailed in the implication for future research section of chapter five.

3.5 Coding of independent measures before analysis

As discussed in section ***3.2*** the independent measures of AT, SE and RES were assessed using established item scales. Each item is coded positively or negatively in relation to the construct of interest. Respondents' scores were then calculated based on their responses to the items. All items are equally weighted. In respect to SE and RES each item utilises a seven-point likert scale. AT uses true/false response items with one point being given for every response which indicates a high AT. AT is scored on a range of 0 to 20 with 20 being high AT. SE and RES scales are scored on a range of 0 to 60, based around the participants' responses to each question. A score of 60 represents a high level of the relevant construct. The coding of the three item scales are listed in the tables below.

Self Efficacy	
Item	**Coding**
I complete tasks successfully	+ve
I excel in what I do	+ve
I misjudge situations	-ve
I don't understand things	-ve
I have little to contribute	-ve
I handle tasks smoothly	+ve
I am sure of my ground	+ve
I come up with good solutions	+ve
I don't see the consequences of things	-ve
I know how to get things done	+ve

Table 3.1: Self-Efficacy Item Coding

Resilience	
Item	**Coding**
I panic easily	-ve
I become overwhelmed by events	-ve
I remain clam under pressure	+ve
I know how to cope	+ve
I feel that I unable to deal with things	-ve
I can handle complex problems	+ve
I readily overcome setbacks	+ve
I can't make up my mind	-ve
I get overwhelmed by emotions	-ve
I am calm even in tense situations	+ve

Table 3. 2: Resilience Item Coding

Ambiguity Tolerance	
Item	**Coding**
A problem has little attraction to me if I don't think it has a solution	-ve
I am just a little uncomfortable with people unless I feel that I can understand their behaviour	-ve
There's a right way and a wrong way to do almost everything	-ve
I would rather bet 1 to 6 on a long shot than 3 to 1 on a probable winner	+ve
The way to understand complex problems is to be concerned with their larger aspects instead of breaking them into smaller pieces	+ve
I get pretty anxious when I'm in a social situation over which I have no control	-ve
Practically every problem has a solution	-ve
It bothers me when I am unable to follow another person's train of thought	-ve
I have always felt that there is a clear difference between right and wrong	-ve
It bothers me when I don't know how other people react to me	-ve
Nothing gets accomplished in this world unless you stick to some basic rules	-ve
If I were a doctor, I would prefer the uncertainties of a psychiatrist to the clear and definite work of someone like a surgeon or x-ray specialist	+ve
Vague and impressionistic pictures really have little appeal to me	-ve
If I were a scientist, it would bother me that my work would never be completed (because science will always make new discoveries)	-ve
Before an examination, I feel much less anxious if I know how many questions there will be	-ve
The best part of working a jigsaw puzzle is putting in the last piece	-ve
Sometimes I rather enjoy going against the rules and doing things I'm not supposed to do	+ve
I don't like to work on a problem unless there is a possibility of coming out with a clear-cut and unambiguous answer	-ve
I like to fool around with new ideas, even if they turn out later to be a total waste of time	+ve
Perfect balance is the essence of all good composition	-ve

Table 3.3: Ambiguity Tolerance Item Coding

A participants PO was operationalised using a planning scenario analysis technique developed by Güss and Strohschneider (1996, 1998). This involved presenting the participants with a scenario that was complex and uncertain, requiring them to plan for future outcomes in order to achieve a certain goal, or resolve presented problems. The participants planning response was then qualitatively analysed by the researcher based around the seven sub-components of PO discussed in section ***2.4***.

The initial stage of the analysis process involved determining the complexity and specificity of the participants' plans. This was achieved through assessing the number of planning elements and measures in each participants plan. A complete description of these terms can be found in section ***2.4***. Briefly, planning elements are considered to be any explicitly listed planning activity. A measure is identified when a participant identifies how they will implement a planning element. The second stage of analysis involved identifying the plans ramifications (width) and explorations (depth). This allowed a visual representation of each plan to be created as demonstrated in figure 7 (Güss, 2002). Explorations are identified as any statement in a participant's plan that is directed outwards, focused on the consequences of actions or information seeking in the system. Ramifications are identified as any statement which considers contingent options, for example if A occurs then B, or if C occurs then D. Ramifications are often identified with *if* and *or* statements.

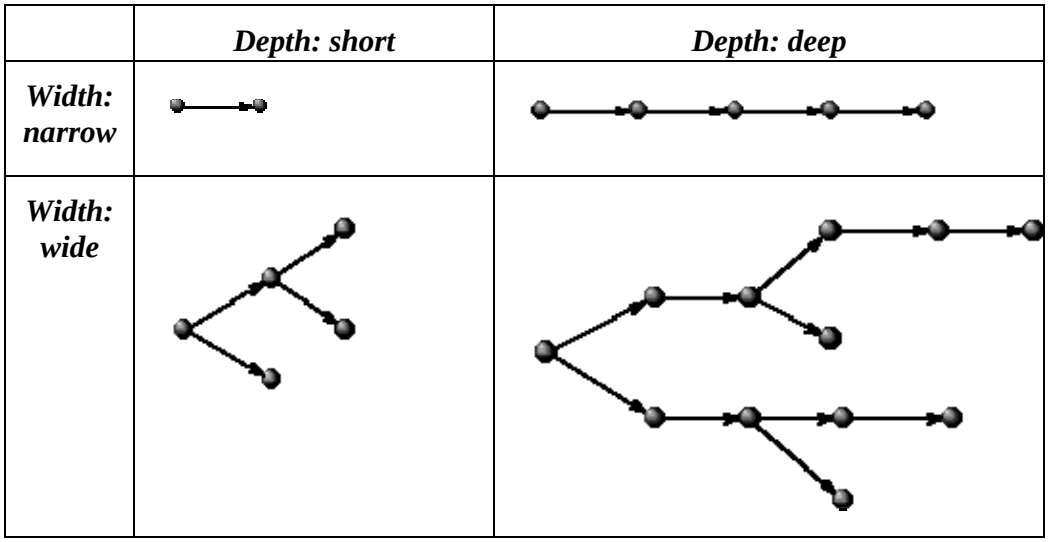


Figure 8: Examples of possible planning types. Source Güss (2002).

The final stage of the scenario analysis involved identifying each participant's strategic planning elements, certainty, control and priority, these concepts are detailed in section 2.4.4. Briefly uncertainty and certainty relate to whether a participant accepts a situation on face value, or whether they question the situation. Control relates to the nature of a participants' action and their approach controlling the situation. Prioritising relates to the quantity and sequence of problem variables considered by the respondent.

Below is a copy of the planning scenario presented to respondents, this is also shown in chapter two.

> Imagine you are part of the management of a Christchurch textile company. Currently you are responsible for the restructuring of the company. Your workload is heavy. Demanding meetings are scheduled for the next few days. Tough decisions have to be made. A board meeting is planned for the end of the week and the directors expect tangible results from you. Tonight, shortly before you plan to leave, you receive a call telling you of unexpected problems in the Invercargill Branch. These problems fall into your area of responsibility and require your presence down south urgently. Your secretary has already booked the early morning flight for you.

This planning scenario has been used in earlier studies by the researcher (Walley, 2004) and discriminates well across the strategic planning elements. Certainty is established as the participant is placed in a predetermined situation; they have been booked on a plane to travel to Invercargill. Participants who view the situation as certain are expected to immediately travel to Invercargill and attempt to deal with the direct problems. Participants with an uncertain orientation are expected to review the necessity of travel and the urgency of the Invercargill situation. They will only make the decision to travel once they have elicited more information relating to the issues. Control orientation is demonstrated by the participants' general approach to resolving the problems. Proactive participants aim to resolve all issues related to the problem and attempt to preempt likely side effects of their decisions. Reactive participants focus on resolving immediate problems as they emerge. Prioritising orientation is elicited by the

presence of two distinct problem sets (Christchurch and Invercargill). Due to the presence of three priority typologies this element was coded using two dichotomous variables; single or multiple and serial or parallel. This was done for ease of use in structural equation modeling. Participants with a simultaneous orientation are expected to resolve both issues in parallel; this was coded as multiple and parallel as multiple problem sets are considered simultaneously. Sequentially orientated participants expected to address one problem set and then the other in serial fashion, this was coded as multiple and serial as multiple problem sets are considered in sequence. Participants with a singular orientation only address one of the problem sets, disregarding the other, this was coded as single and serial as only one problem set was considered.

3.5.1 Coding of dependent measures before analysis

Analysis of the dependent measures (profit, revenue and staff growth) revealed a negatively skewed distribution. To remove this skew a natural logarithmic transformation was applied. Reflex and reciprocal transformations were also tried but did not as effectively address the problems of skew. This transformation required a constant of 300% growth to be applied to the data to remove all negative values. Precise details of this transformation are discussed throughout chapter four.

3.6 Statistical analysis techniques

The primary survey data was analysed using structural equation modeling and was accompanied by descriptive statistics and variable correlations. Analysis was performed using SPSS version 13.0 and AMOS version 6.0. SPSS was used to generate descriptive statistics, run confirmatory factor analysis and variable correlations while AMOS was employed for structural equation modeling.

3.6.1 Descriptive statistics

Basic descriptive statistics were generated for the data using SPSS and are discussed in detail in chapter four. SPSS was also used to test skew and kurtosis in the data, variable correlations and the internal validity of the AT, SE and RES item scales.

3.6.2 Structural equation modeling (SEM)

SEM is a technique which uses various types of models to predict relationships among observed variables with the goal of testing a hypothesised model proposed by the researcher (Schumacker and Lomax, 2004). This allows hypothesised models to be tested in SEM to understand how sets of variables define constructs and how the constructs are related to each other (Schumacker and Lomax, 2004). SEM therefore applies a confirmatory approach to analysis (Byrne, 2001) enabling data to be analysed for inferential purposes more effectively than techniques such as multiple regression or exploratory factor analysis would allow (Byrne, 2001). Structural models are made up of various latent variables and observed variables. Latent variables are variables that are not directly observed or measured (Schumacker and Lomax, 2004) and are inferred from a set of observed variables. For example self efficacy is a latent variable inferred from a ten item scale. The scale items are therefore observed variables which are directly measured to infer/define the latent construct (Byrne, 2001). These variables are then defined as either independent or dependent. This classification determines the direction of path relationships of the hypothesised model (Byrne, 2001).

SEM models are then presented in a graphical format with observed variables being shown as boxes, latent variables being shown as circles and directional paths being hypothesised by arrows between the variables. Kline (1998) cited in Wright (2006) explains that a structural equation model is the hypothesised pattern of directional and non-directional linear relationships among a set of variables. The primary purpose of SEM is therefore to determine the significance of variation and co-variation amongst the variables. The adequacy of the model is then assessed based around the fit of the observed covariance with the covariance implied by the hypothesised model. The closeness of the covariance in the hypothesised model to the data indicates the overall fit of the model (Byrne, 2001) and the strength of the researchers' hypotheses.

Wright (2006) provides a good explanation of the issues in regard to causality and SEM. In summary SEM only provides a technique to *propose* directional causal relationships between variables, it does not provide conclusive evidence to claim cause

and effect relationships between variables. While this is a strength of SEM, allowing a researcher to begin to test the theoretical associations and causal ideas behind a model, a researcher can only test for causality when a longitudinal methodology is employed (Byrne, 2001). Therefore the inability to test for causality with SEM is limited by the cross sectional nature of this thesis methodology.

3.6.3 Justification for SEM

There are four main advantages identified in the literature for using SEM in contrast to path or regression analysis when analysing survey data with latent constructs (Byrne, 2001; Schumacker and Lomax, 2004): (1) SEM allows the researcher to test the contribution of individual observed variables to each latent construct (Byrne, 2001); (2) SEM better acknowledges the presence of measurement error when statistically analysing data (Schumacker and Lomax, 2004); (3) SEM allows for observed variables to be 'grouped' into latent variables, instead of modeling singularly (Wright, 2006); and (4) SEM places an emphasis on model fit and allows the researcher to modify their hypothesised model to improve fit with the data (Byrne, 2001). Path and regression analysis focus solely on the significance of the relationships between the variables providing minimal scope for model refinement (Schumacker and Lomax, 2004).

3.7 Ethical Issues

This research obtained approval from the University of Canterbury Human Ethics Committee. Due to the sensitive nature of data participants were given the option of remaining anonymous. Of the 386 respondents, 225 opted to remain anonymous. All participants were given the option of being removed from the data set at any stage during the research process. No participants actioned the option. No concerns or queries were raised by any participants in regards to ethics of the research. Given the commercially and personally sensitive information supplied in the survey, all participants were assured of anonymity and privacy in all written and verbal reports.

Chapter Four

- Results

4.0 Quantitative Results

In this chapter, I present the empirical results of this thesis. This includes (1) an overview of the research measure and analytical techniques used, (2) a summary of the descriptive statistics and correlations between the variables, (3) presentation and evaluation of the two structural equation models and a discussion regarding the accepted model, (4) and finally the conclusions of this thesis in relation to the specific hypothesis identified in chapter two.

4.0.1 Research Measure

In the previous chapter, I presented a detailed discussion regarding selection of research measures and questionnaire development. Briefly the instrument comprises of three item sub-scales, one open ended scenario question, five demographic questions and three questions relating to organisational performance. The questionnaire was administered via mail and participants were selected randomly from the New Zealand Business Who's Who 2005 listings. 386 usable responses were obtained.

4.0.2 Analysis techniques

The previous chapter also presented a detailed discussion regarding the selection of analysis techniques. A brief summary is provided in this chapter. Initial descriptive tests were performed on the data set using SPSS 13.0. These included testing for normality through skew and kurtosis tests, reviewing the internal validity of the multiple item scales, correlation and mutlicollinearity tests between variables and presentation of mean, standard deviation and range statistics related to each variable. Two hypothesised models were tested using AMOS 6.0. One of these two offered a better fit with the data.

4.1 Descriptive Statistics and Preliminary Analysis

This section will present results regarding the descriptive statistics and frequencies in relation to the variables utilised in this study. This is accompanied by Cronbach alpha tests of the internal reliability of the various items scales used in this study. Analysis of skew and kurtosis is also addressed in this section. Finally, a brief discussion regarding general exploratory factor analysis is included.

4.1.1 Descriptive statistics of independent scale variables

Table 4.1 presents the means, standard deviations, ranges, skew, kurtosis and Cronbach alpha values for the independent scale variables used in this study.

Variable	Mean	SD	Range	Skew	Kurtosis	Alpha
AT	9.93	3.61	1-19	-.07	-.39	.70
RES	43.06	9.12	0-60	-.53	.64	.83
SE	45.26	7.99	6-60	-.63	.94	.86
Complexity	5.09	1.82	1-12	.57	.42	N/A
Specificity	1.95	1.45	0-8	.67	.49	N/A
Depth	2.57	1.11	0-6	.38	.33	N/A
Width	.49	.62	0-2	.87	-.25	N/A

Table 4.1: Descriptive statistics of independent scale variables

All of the multiple item variables achieved the suggested minimum Cronbach alpha of .70 (Nunnally, 1978). The four planning measures are single item and invalid for internal reliability testing. Tests for skew and kurtosis were within the acceptable range of -2.00 to +2.00 indicating no issues in regard to the normality of these particular dependent measures.

4.1.2 Descriptive statistics of dependent variables

Table 4.2 presents the means, standard deviations, ranges, skew and kurtosis for the dependent scale variables used in this study after natural log transformation. Internal reliability could not be tested due to the single item nature of these measures.

Variable	Mean	SD	Range	Skew	Kurtosis
Profit Growth (ln)	1.23	.33	-.69-2.7	-4.38	11.36
Revenue Growth (ln)	1.22	.22	.69-2.7	2.68	12.53
Staff Growth (ln)	1.19	.16	.69-1.79	1.01	1.88

Table 4.2: Descriptive statistics of dependent variables

Both revenue and profit growth showed some skew and kurtosis. A common cause of non-normality is the presence of outliers in the sample. Analysis of potential univariate outliers found six cases outside of three standard deviations in respect to revenue growth and no outliers in respect to profit growth. These cases constitute 1.55% of the total sample. As suggested by Cohen and Cohen (1983), it is better to retain outliers when they constitute a small proportion of the sample. These outliers were therefore retained in the sample as they did not affect the skew and kurtosis of the variables. Despite being outside of the commonly acceptable range for skew and kurtosis, no further transformations beyond the natural log transformation was deemed to be necessary. This is due to skew and kurtosis being very common in studies related to financial data, with much larger variations being accepted throughout the literature. The most commonly cited reason for this occurrence is the bias towards companies with positive growth reporting data, while declining companies often opt not to participate in research, skewing the sample. Second, as structural equation modeling is the primary data analytic technique used in this thesis, issues of non-normality were addressed though the use of bootstrapping (Byrne, 2001). The use of bootstrapping tackles the issues of skew and kurtosis in the dependent variables. The bootstrapping technique is discussed in detail later in this chapter. As cited by Byrne (2001) and Schumacker and Lomax (1998), bootstrapping is an ideal technique for addressing non-normality issues in samples of approximately 400 or greater. Finally, the skew and kurtosis statistics reported in this thesis are well within the bounds accepted throughout the literature.

4.1.3 Descriptive statistics of independent nominal variables

Variable	Frequency	Skew	Kurtosis
Uncertain	0.41	.36	-1.88
Certain	0.59	-.36	-1.88
Reactive	0.71	-.92	-1.17
Proactive	0.29	.92	-1.17
Parallel	0.74	1.07	-.85
Serial	0.26	-1.07	-.85
Multiple	0.26	-1.09	-.82
Singular	0.74	-1.09	-.82

Table 4.3: Descriptive statistics of independent nominal variables

Nominal measures are single item and invalid for internal reliability testing. Inter-rater reliability was averaged at 0.76 across all nominal planning measures. Three inter-raters were used. All inter-raters had no prior knowledge of this research and were only given definitions of each planning element and participant scenario responses prior to completing the assessment. This level of inter-rater reliability is deemed to be appropriate to show reliability in the measure. All 386 participants were reviewed by the inter-raters. Tests for skew and kurtosis were within the acceptable range of -2.00 to +2.00 indicating no issues in regard to the normality of these particular dependent measures.

4.1.4 Descriptive statistics of demographic/covariate variables

Three demographic/covariate variables were measured; gender, number of business owned/managed and business experience. There was some association between the covariates and limited associations between experience and staff and revenue growth. One way analysis of variance tests and bivariate correlations were performed to test for any significant covariate effects. A significance level of .05 was used for all tests.

Variable	Mean/Occurrence	SD	Range
Gender	Male = 306	N/A	N/A

	Female = 48		
Experience	22.6	4.02	2 - 65
Business owned	2.98	11.14	1 - 36

Table 4.4: Descriptive statistics of covariates

There were no significant covariate effects with respect to gender and its association with the three performance measures; staff growth (F = .97, p = .565), revenue growth (F = .91, p = .721), profit growth (F = .76, p = .927). The only significant low correlation in respect to gender was with business experience (r = -.27, p = .000).

There were no significant covariate effects with respect to experience and its association with the three performance measures; staff growth (F = 1.24, p = .09), revenue growth (F = 1.05, p = .388), profit growth (F = 1.28, p = .107). There was a significant negative low correlation between experience and revenue growth (r = -.217, p = .000).

There were no significant covariate effects with respect to the number of businesses owned/managed by the participant and the three performance measures; staff growth (F = 1.29, p = .101), revenue growth (F = 1.07 p = .392), profit growth (F = 1.04, p = .427). There was a significant positive low correlation between number of business owned and experience (r = .26, p = .000). This is expected as years of experience would typically increase with the number of businesses owned/managed.

There is clearly minimal significant association between the covariates measured in this research and financial measures of organisational performance. These findings imply that businesses performance is not associated with the gender or number of businesses/owned managed by the individual and is only be slightly moderated by experience. These variables have only been included in this thesis for descriptive purposes. For this reason, gender and number of businesses owned/managed will not be

tested in the structural model. However, given an apparent, though low relationship between experience and revenue growth this variable will be tested structurally.

4.1.5 Preliminary factor analysis

Factor analysis was performed on the ambiguity tolerance (AT), self efficacy (SE) and resilience (RES) item scales to complement the internal reliability tests discussed earlier in this chapter. As discussed the purpose of this thesis is not to develop or test the validity of the psychometric instruments. Factor analysis is only being used as a check to the quality and uni-dimensionality of the measurement instruments.

AT has the lowest reported internal reliability (0.70) of the three scales used in this research. The measure also performed poorly in factor analysis with seven components being extracted obtaining an eigenvalue of over 1 (oblique rotation used).

	Initial Eigenvalues			Extraction Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.375	16.873	16.873	3.375	16.873	16.873
2	1.661	8.303	25.176	1.661	8.303	25.176
3	1.438	7.189	32.365	1.438	7.189	32.365
4	1.211	6.054	38.419	1.211	6.054	38.419
5	1.109	5.547	43.967	1.109	5.547	43.967
6	1.069	5.346	49.313	1.069	5.346	49.313
7	1.040	5.201	54.514	1.040	5.201	54.514
8	.961	4.805	59.320			
9	.892	4.460	63.780			
10	.811	4.055	67.835			
11	.800	3.998	71.833			
12	.785	3.927	75.760			
13	.734	3.670	79.430			
14	.729	3.644	83.074			
15	.663	3.313	86.387			
16	.602	3.011	89.398			
17	.593	2.967	92.365			
18	.550	2.751	95.116			
19	.498	2.488	97.604			
20	.479	2.396	100.000			

Table 4.5 Total Variance Explained Ambiguity Tolerance

There are also some issues in regard to the face validity of the AT measure. Particular items (4, 12, 13, 14, 15 and 16) were somewhat vague and not entirely appropriate for the business context of this research (refer to chapter three). These items were not removed as the scale has good reported reliability in the literature. Despite these criticisms, the scale does obtain the minimum acceptable Cronbach alpha. The scale is therefore retained in its current state for structural analysis but any future research or interpretation must be aware of the apparent faults in the measurement instrument for AT.

SE has a high reported internal validity (0.86). The measure performed well in factor analysis with two components being extracted obtaining an eigenvalue of over one (oblique rotation used).

	Initial Eigenvalues			Extraction Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.573	45.731	45.731	4.573	45.731	45.731
2	1.230	12.304	58.035	1.230	12.304	58.035
3	.762	7.624	65.659			
4	.715	7.146	72.806			
5	.641	6.406	79.212			
6	.614	6.145	85.357			
7	.461	4.613	89.969			
8	.423	4.225	94.195			
9	.306	3.065	97.260			
10	.274	2.740	100.000			

Table 4.6 Total Variance Explained Self Efficacy

The correlation matrix indicated good consistency throughout the construct with all correlations being significant. Communalities were good ranging from .42 to .7. There are no apparent issues with respect the face validity of the scale items. From a measurement perspective, the SE scale utilised in this thesis is deemed to be of very good reliability and validity.

RES has a high reported internal validity (0.83). The measure performed well in factor analysis with two components being extracted obtaining an eigenvalue of over one (oblique rotation used).

	Initial Eigenvalues			Extraction Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.082	40.820	40.820	4.082	40.820	40.820
2	1.438	14.379	55.199	1.438	14.379	55.199
3	.942	9.418	64.617			
4	.847	8.467	73.085			
5	.643	6.434	79.519			
6	.619	6.185	85.704			
7	.592	5.921	91.625			
8	.323	3.226	94.851			
9	.274	2.738	97.589			
10	.241	2.411	100.000			

Table 4.7 Total Variance Explained Resilience

The correlation matrix indicated good consistency throughout the construct with all correlations being significant. Communalities were varied ranging from .26 to .74. There are no apparent issues with respect to the face validity of the scale items. From a measurement perspective the RES scale utilised in this thesis is deemed to be of very good reliability and validity.

4.2 Correlations between variables

Bivariate correlations between the research variables used in the structural equation modeling are shown in Table 4.8. For the reasons discussed in section ***4.1.4***, the covariates of gender and businesses/owned managed will not be tested in the structural modeling process. Correlations were calculated to provide a general overview of the strength of the relationships between the research variables and to identify any potential multicollinearity issues in the data set. Significance was tested at a 0.01 level (2-tailed).

On reviewing the significant correlations there are in most cases significant relationships between the independent variables. These relationships are particularly

strong between the various planning orientation (PO) sub-elements. The dependent performance measures demonstrated a significant positive relationship within the group. The correlations between independent and dependent variables did not demonstrate the same level of significance with only staff growth showing a consistent significant relationship with the independent variables.

There is no commonly accepted cut off point for identifying multicollinearity from bivariate correlations. Literature frequently indicates that an *r* value of anywhere between .5 and .8 may indicate some issues of multicollinearity (Dielman, 1996). Adopting a conservative stance this thesis will investigate mutlicollinearity at the $r > .5$ level. As shown in Table 4.8, there are 21 instances where *r* exceeds the minimum cut off point of .5. Nineteen of these cases concern the relationship between various planning orientation elements. As a number of these elements are related closely at a conceptual and measurement level this is to be expected. While no action was taken to remove or factor out particular variables, it is likely that particular elements will explain the same variation rendering some measures redundant in the final structural model. Another issue of potential multicollinearity exists between the independent variables of self efficacy and resilience ($r = .66$). As discussed in chapter two, a positive association between these variables is to be expected and it is intuitive that some multicollinearity exists. This must be taken into account when developing the structural model, but as mutlicollinearity is not a strict assumption of SEM, analysis can proceed with the data in its present form. Finally, there is one potential issue of multicollinearity within the dependent performance measures; revenue growth and staff growth ($r = .72$). In this case it is likely that some multicollinearity is present as it is intuitive that staff and revenue will all grow at similar rates within organisations. This result may allow particular dependent variables to be removed from the final structural model. This will be tested and discussed later in this chapter.

Research Variables	Ambiguity Tolerance	Resilience	Self Efficacy	Complexity	Specificity	Depth	Width	Uncertain	Certain	Reactive	Proactive	Parallel	Serial	Multiple	Singular	Profit Growth	Revenue Growth	Staff Growth	Experience
Ambiguity Tolerance	1.00																		
Resilience	***.41***	1.00																	
Self Efficacy	***.3***	***.66***	1.00																
Complexity	***.19***	***.23***	***.22***	1.00															
Specificity	***.16***	***.18***	***.19***	***.66***	1.00														
Depth	***.2***	***.22***	***.2***	***.79***	***.64***	1.00													
Width	***.24***	***.25***	***.27***	***.57***	***.41***	***.57***	1.00												
Uncertain	***.26***	***.24***	***.27***	***.42***	***.37***	***.46***	***.8***	1.00											
Certain	***-.26***	***-.24***	***-.27***	***-.42***	***-.37***	***-.46***	***-.8***	N/A	1.00										
Reactive	**-.14**	***-.15***	***-.18***	***-.55***	***-.46***	***-.52***	***-.46***	***-.4***	***.4***	1.00									
Proactive	**.14**	***.15***	***.18***	***.55***	***.46***	***.52***	***.46***	***.4***	***-.4***	N/A	1.00								
Parallel	**.15**	***.17***	***.16***	***.48***	***.45***	***.5***	***.5***	***.44***	***-.44***	***-.57***	***.57***	1.00							
Serial	**-.15**	***-.17***	***-.16***	***-.48***	***-.45***	***-.5***	***-.5***	***-.44***	***.44***	***.57***	***-.57***	N/A	1.00						
Multiple	.09	***.18***	***.21***	***.41***	***.36***	***.43***	***.39***	***.39***	***-.39***	***-.28***	***.28***	***.36***	***-.36***	1.00					
Singular	-.09	***-.18***	***-.21***	***-.41***	***-.36***	***-.43***	***-.39***	***-.39***	***.39***	***.28***	***-.28***	***-.36***	***.36***	N/A	1.00				
Profit Growth	.1	.12	**.17**	.13	.13	**.14**	**.29**	***.33***	***-.33***	**-.21**	**.21**	**.23**	**-.23**	.11	-.11	1.00			
Revenue Growth	.08	.09	.1	**.2**	.19	**.19**	**.28**	**.3**	**-.3**	**-.15**	**.15**	**.17**	**-.17**	**.21**	**-.21**	***.45***	1.00		
Staff Growth	***.19***	***.23***	***.25***	***.12***	***.21***	**.21**	***.37***	***.4***	***-.4***	**-.18**	**.18**	**.22**	**-.22**	**.2**	**-.21**	***.46***	***.72***	1.00	
Experience	.07	.01	-.09	-.02	.00	-.06	-.04	-.04	.04	-.00	.00	.03	-.03	-.06	.06	.00	***-.21***	-0.12	1.00

Figures in bold type indicate significance at the 0.01 level (2-tailed)

Table 4.8 Correlation matrix of variables used in structural equation modeling

4.3 Structural Equation Modeling (SEM)

Chapter three provided a detailed justification for the use of SEM as the primary method of data analysis in this thesis. In this section I will detail the SEM analysis. (1) I provide an overview of the specific techniques and methods utilised. This includes a discussion on the measurement model and confirmatory factor analysis (CFA), item parceling, bootstrapping and model fit criteria. (2) I discuss the testing of the two hypothesised models and reasons for final model selection.

4.3.1 Measurement and structural models

Byrne (2001) explains that SEM can be decomposed into two sub-models: a measurement and a structural model. The measurement models purpose is to define the relations between the observed and latent variables. The structural model then proceeds to define the relationships between the latent variables, specifying how the various latent constructs directly or indirectly exert influence over each other (Byrne, 2001).

CFA is used to test the measurement model where the observed variables and their relationship to the latent construct is tested for uni-dimensionality to ensure that observed variables are adequately measuring the latent construct. These tests are similar to the preliminary factor analysis tests discussed in section ***4.1.5***. However, those tests were focused on determining whether bundling of the items into cumulative scores was allowable in this research.

In this study each of the measurement models related to AT, SE, RES, PO and the dependent measures were independently assessed. This allowed the goodness-of-fit indices for each measurement model to be tested to ensure they were accurately measuring the latent constructs. This process is widely used in the research to allow refinement of the measurement models removing any elements of the measurement model which are poorly fitted to the overall data set. This in turn improves the overall fit of the structural model (Wright, 2006).

4.3.2 Item parceling

Item parceling is a technique that can be used to combine multiple related items into a single score or variable for SEM. In effect, the parcel of items acts as one indicator for a given latent variable (Hall, Snell and Foust, 1999). This has the effect of improving overall model fit as there are fewer parameters to estimate and often leads to reduction in sampling error (Bandalos, 2002). However, items can only be parceled when they represent a uni-dimensional construct and have a Cronbach alpha coefficient of greater than 0.7 (Meade and Kroustalis, 2006). Item parceling was used in this study on the AT, SE and RES independent variables. All variables had an alpha value of 0.7 or more. As demonstrated in preliminary factor analysis in section ***4.1.5***, uni-dimensionality was only a potential issue with AT. For this reason caution will be used when interpreting results if AT remains in the final structural model. It is also important to acknowledge the presence of two factor solutions for SE and RES. However given the presence of a large general factor in both scales this is not considered to be an issue (Muchinsky, 1997).

4.3.3 Bootstrapping

Bootstrapping is a procedure which allows a researcher to create multiple sub samples from the original data set (Byrne, 2001). Bootstrapping as a procedure in SEM presents a number of advantages. (1) It allows the researcher to test the stability of parameter estimates and therefore report fit statistics with a greater degree of accuracy (Byrne, 2001). (2) It provides a mechanism to address situations where assumptions of normality may not hold or sample size is slightly inadequate. While there are no major issues of non-normality in this data set, apart from minor skew and kurtosis issues in the revenue and profit growth dependent variables, it was thought prudent to run bootstrap analysis to ensure this non-normality was not affecting the results. Two bootstrapping approaches have been utilised for this analysis. The first is maximum likelihood (ML) estimation, which is the standard bootstrapping procedure provided by AMOS 6.0. The second is Bollen-Stine bootstrap that provides a specific method for assessing whether the null hypothesis of a model is correct (Byrne, 2001). This method effectively applies a bootstrap method to the x^2 goodness-of-fit statistic; this is particularly effective at identifying abnormalities caused by non-normal data (Schumacker and Lomax, 2004).

Nevitt and Hancock (2000) assert that Bollen-Stine bootstrapping is considered the best method to address non-normality in SEM in research with a sample size of under 500, making this technique ideal for this study.

4.3.4 Model fit criteria

There are a number of goodness-of-fit criteria used in SEM to assess the fit between the hypothesised structural/measurement models and the data set (Bagozzi and Youjae, 1988). While all of these statistics in essence report some form of fit, the manner in which these statistics are created varies greatly. In this thesis I used seven indices to evaluate model fit. These are as follows:

1. **Chi-square test:** this is the most common test used to assess the goodness of fit between the predicted and obtained covariance matrices. A non-significant chi-square of ($p > 0.5$) indicates satisfactory fit (Schumacker and Lomax, 2004).

2. **Goodness of fit (GFI):** a measure of the relative amount of variance and covariance in the sample that is jointly explained by predicted square residuals (Byrne, 2001). GFI values of .90 or higher indicate good model fit (Byrne, 2001).

3. **Adjusted goodness of fit (AGFI):** measures the amount of fit by taking the GFI and adjusting by the degrees of freedom in the specified model. This is useful for ensuring a parsimonious model through penalising for extraneous factors. AGFI values of .90 or higher indicate good model fit (Byrne, 2001).

4. **Comparative fit index (CFI):** assesses fit relative to other models and uses an approach based on the noncentral x^2 distribution with noncentrality parameter, τ_i (Ullman, 2006). Effectively this is the difference between the examined model and the independence model; CFI values greater than .95 are indicative of good fitting models (Hu and Bentler, 1999).

5. **Root mean square error of approximation (RMSEA):** estimates the lack fit in an examined model compared to a perfect saturated model (Steiger, 2000). RMSEA values of .06 or less indicate a close fitting model (Hu and Bentler, 1999), while values larger than .10 are indicative of poor fitting models (Browne and Cudeck, 1993).

6. **Lagrange multiplier test (LM):** estimates changes in the model if fixed parameters were estimated or if more parameters were added to the model. Chi-square change is presented for various model iterations. Multivariate LM tests are considered more appropriate as they account for overlapping variance between parameters (Ullman, 2006).

7. **Wald test (W):** estimates changes in the model if estimated parameters were fixed or if parameters were removed from the model. In effect this is the opposite of an LM test. The Wald test uses backward stepwise regression to remove parameters which do not contribute a significant R^2 change (Ullman, 2006). This test is particularly useful in developing a parsimonious model.

4.3.5 Model refinement process

Ullman (2006) identifies two primary reasons for modifying an SEM model; first to test hypothesis through comparing variant models for best fit and second to improve model fit through comparison of refined or altered models. This refinement process is also referred to as specification search (Schumacker and Lomax, 2004). Byrne (2001) and Ullman (2006) emphasise that any model which has undergone major structural modification needs to be interpreted very carefully and cannot be claimed to be confirmatory in nature. It is important to reiterate that SEM is a confirmatory statistical technique; therefore any major changes to the model which alter its theoretical structure lead to SEM becoming an exploratory technique. Any changes must be theoretically supported (Byrne, 2001).

Beyond theoretical justification any changes to an SEM model must be supported by significant changes in particular goodness of fit measures (Schumacker and Lomax, 2004). The measures used to assess the model refinement process in this research are; (1) the chi-square difference test (criterion of $p > .05$), (2) RMSEA (non-overlapping confidence intervals) (3) LM tests for selectively adding parameters to the model and (4) Wald tests for selectively eliminating parameters (Bentler, 1990; Jöreskog & Sörbom, 1996).

Schumacker and Lomax (2004) provide a succinct explanation of the model refinement process. The process is considered to be iterative following a number of steps:

1. Specify initial model from theoretical understanding.
2. Test the theoretical model.
3. Conduct a specification search on the measurement and structural model elements.
4. Check to see if the parameters are of the expected magnitude and direction, examine goodness of fit indices.
5. Check the statistical significance of any non-fixed parameters (Wald test). Should any parameters be fixed?
6. Examine the modification indices, expected parameter change statistics and the Lagrange multiplier. Should any parameters be freed from the subsequent model?
7. Check any peculiarities in the standardised residual matrix.
8. Cross validate the new model using a new sample or through bootstrap and jackknife procedures.

Byrne (2001) cited in Wright (2006) explains that there are three primary ways through which SEM models can be re-specified to improve fit: (1) by including additional variables, (2) by including additional paths in the measurement model to more accurately model relationships and (3) eliminate variables and paths from the measurement model. This process was conducted in accordance with the eight steps

suggested above by Schumacker and Lomax (2004). Changes to the model were considered to be significant if there was a significant chi square change statistic between the two models. In addition all changes needed to be theoretically supported in the literature.

Path coefficients were also investigated in addition to the LM and W tests for adding and removing paths in the specification search. Paths were removed with small or insignificant coefficients. Comrey and Lee (1992) posit that standardised factor loadings can be interpreted as follows: below .46 is poor, between .46 and .54 is fair, between .55 and .62 is good, between .63 and .70 is very good and above .71 is excellent. However as discussed by Schumacker and Lomax (2004) it is important to be aware of the magnitude of the co-efficient, other goodness of fit statistics, sample size and assumptions of normality in the data when interpreting and considering the removal/inclusion of various paths. Also as discussed by Byrne (2001), Schumacker and Lomax (2004) and Ullman (2006) the nature of the research whether it be confirmatory, exploratory, empirical or conceptual can also influence whether the removal/inclusion of paths is justified. In some research settings paths as low as .20 are considered to have interpretable value. Any path changes made in this research were assessed based around all criteria listed above.

4.3.6 Results: Measurement Models

Two measurement models were tested prior to development of the structural model. These models related to the independent variables and the dependent variables. The original measurement model related to the independent variables (Figure 9) is shown below. This model was considered admissible by AMOS with no issues related to under specification. However, the original model only had marginal goodness of fit statistics so some model refinement was undertaken. The original model exhibited generally good path coefficients across all latent factors. The measurement model was constructed based around three latent variables. The first latent factor for psychological attributes (psych. att.) comprised three manifest indicators of ambiguity tolerance (AT), resilience (RES) and self efficacy (SE). The path coefficients for the psychological attributes latent factor

were .43 for AT, .96 for RES and .69 for SE. The second latent factor for the planning content comprised four manifest indicators of complexity, measures, depth and width. The path coefficients for the planning content latent factor were .90 for complexity, .72 for measures, .88 for depth and .63 for width. The final latent factor for planning strategy comprised four manifest variables of uncertain, proactive, parallel and multiple. As these are dichotomous variables only one of the options for each strategic planning element was included. The option for each variable that was hypothesised to have a positive relationship to the other variables was included to minimise any potential negative variance issues (Byrne, 2001).

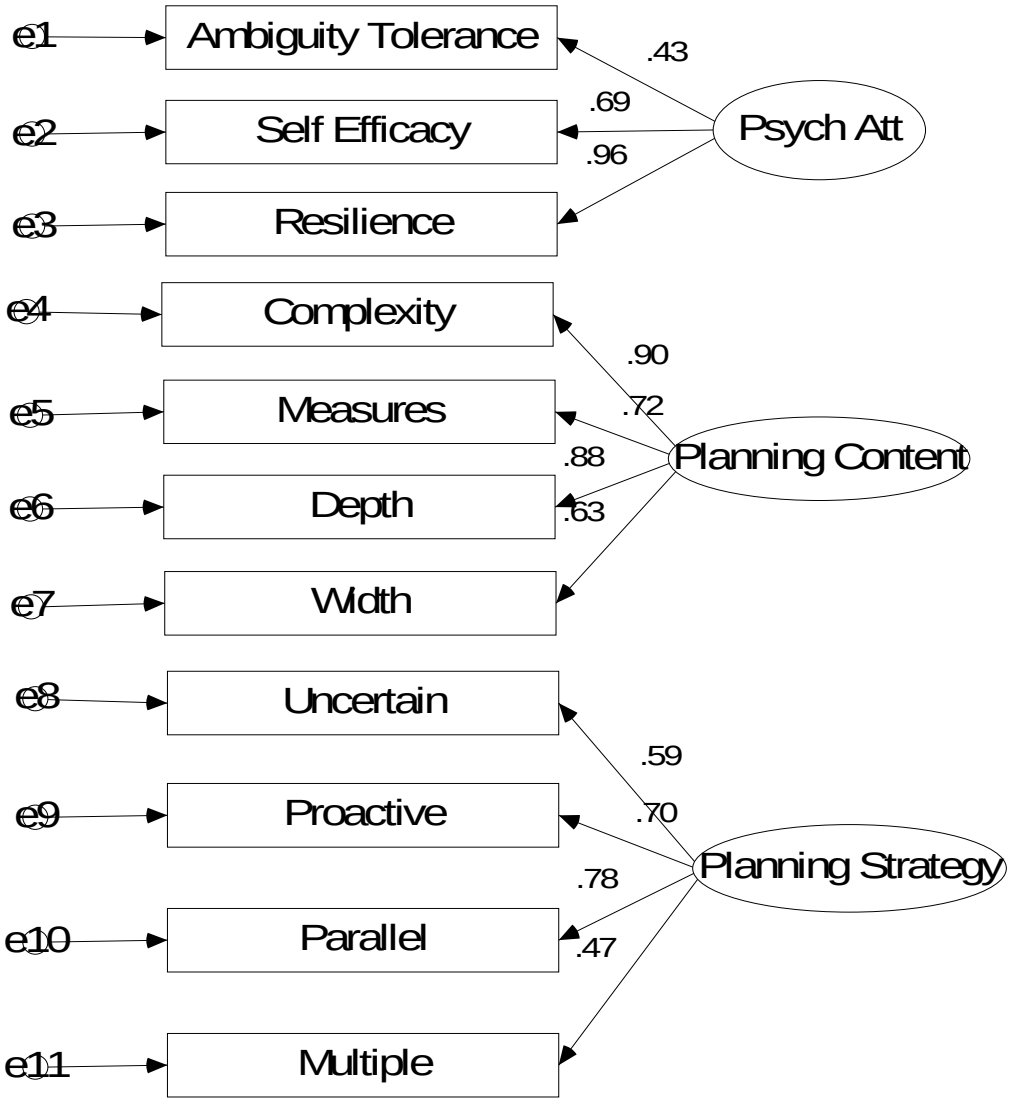


Figure 9: Original measurement model for independent variables

In order to improve the goodness of fit statistics related to this model (refer to Table 4.9 below), two changes were made to the model. The first change involved correlating the three latent factors of psychological attributes and planning content and planning strategy. This is theoretically supported by the literature review and hypotheses stated in chapter two with respect to the relationship between PO and AT, RES and SE. To summarise the literature reciprocal positive relationships between elements of PO and AT, RES and SE have been established. Correlating the latent factors further improved model fit, even though the path coefficients between two of the structures are low at 0.30 and 0.33 and of limited interpretable value (Comrey and Lee, 1992). The second change involved running a series of LM and W tests on the model investigating whether specific manifest indicators should be removed from, or added to the model. After running a series of tests the optimal goodness of fit was achieved with the removal of the width manifest indicator. This indicator was removed for three reasons. (1) Its removal significantly improved the goodness of fit in the final measurement model. (2) The raw data has limited variation skewing the results and (3) the variable is strongly inter-correlated with four other PO manifest indicators (see Table 4.8 above). The final measurement model is shown below in Figure 10.

Model	**Goodness of Fit Indices**			
	GFI	AGFI	CFI	RMSEA
Original Model ($x^2 = 648.2$; $df = 44$)	.82	.72	.7	.18
Final Model ($x^2 = 65.26$; $df = 32$)	**.97**	**.94**	**.98**	**.05**

Table 4.9 Goodness of Fit Statistics for Original and Final Measurement Models

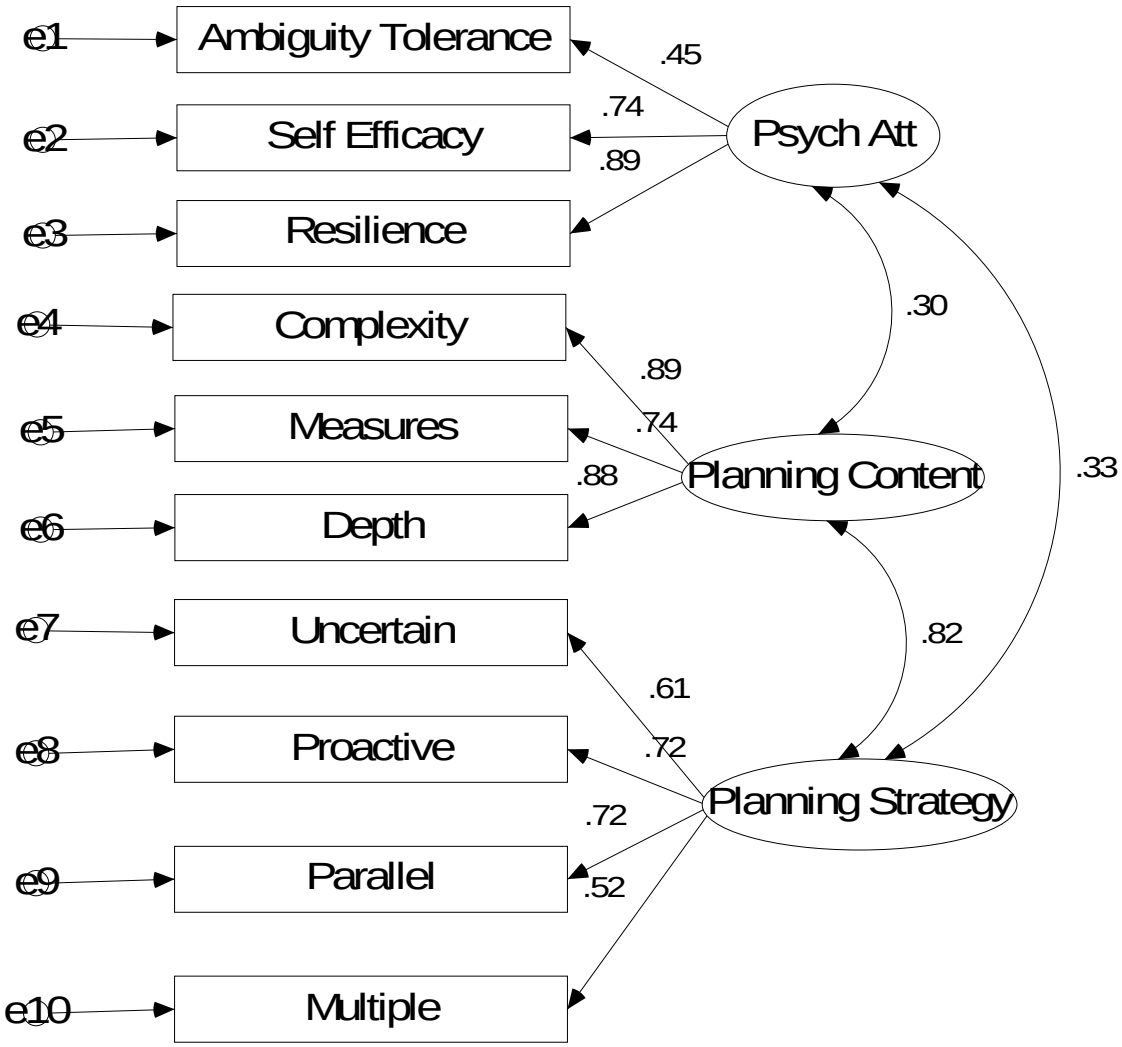


Figure 10: Final measurement model for independent variables

Comparison between the original and final model chi-squares was significant at $p > .005$ ($\Delta\chi^2 = 582.93$; $\Delta df = 12$). The final goodness of fit statistics indicate good model fit with the final measurement model. The final measurement model is considered to be sufficient to proceed with structural modeling.

The second measurement model that was tested relates to the dependent measures of staff, profit and revenue growth. This model is comprised of a single latent factor (performance) and three manifest indicators (staff, revenue and profit growth). The original model (Figure 11 below) was admissible in AMOS and demonstrated ideal fit.

Model refinement was not necessary. This degree of fit is to be expected given the nature of the three variables, (see chapter three for discussion on the dependent measures). Briefly, it is intuitive to expect staff, revenue and profit growth to share a close relationship. Table 4.10 below displays the goodness of fit statistics related to this model.

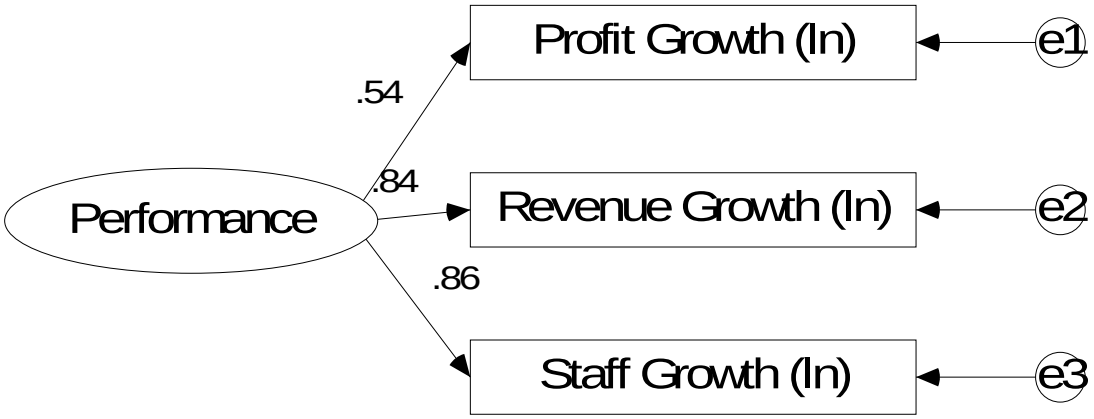


Figure 11: Measurement model for dependent variables

Model	**Goodness of Fit Indices**		
	GFI	CFI	RMSEA
Original Model ($x^2 = 0.00$; $df = 0$)	1.0	1.0	.05

Table 4.10 Goodness of Fit Statistics for Original and Final Measurement Models

4.3.7 Results: Structural Model

Having determined the two measurement models for the independent and dependent variable groups, the next stage was to construct a structural model to test the overall goodness of fit with the data. The structural model determines the fit between the latent factors within the model.

The hypothesised model (Figure 7) that infers a direct relationship between the psychological attributes and performance latent constructs was tested first, as a direct

relationship would make a more significant contribution. The structural model based on figure 7 (Figure 12) is shown below. This model varies from the hypothesised model (Figure 7, chapter two) as a result of measurement model refinements; the width manifest indicator is removed. This model was considered admissible by AMOS with no issues related to under-specification. The model demonstrated good goodness of fit statistics. However, the model exhibited generally poor path coefficients across all latent factors making interpretation difficult; some model refinement was therefore undertaken. The structural model was constructed based around the three latent factors determined through testing the measurement models (psychological attributes, planning content, planning strategy and performance). As shown in Table 4.12 below the goodness of fit statistics were acceptable for this model. The path coefficients between the latent factors (psychological attributes and planning content 0.3, psychological attributes and performance 0.11, psychological attributes and planning strategy 0.35 and planning content and performance -0.23) were poor allowing for minimal interpretation of relationships between the various factors (Comrey and Lee, 1992). However, the path coefficients within the measurement models still remained high.

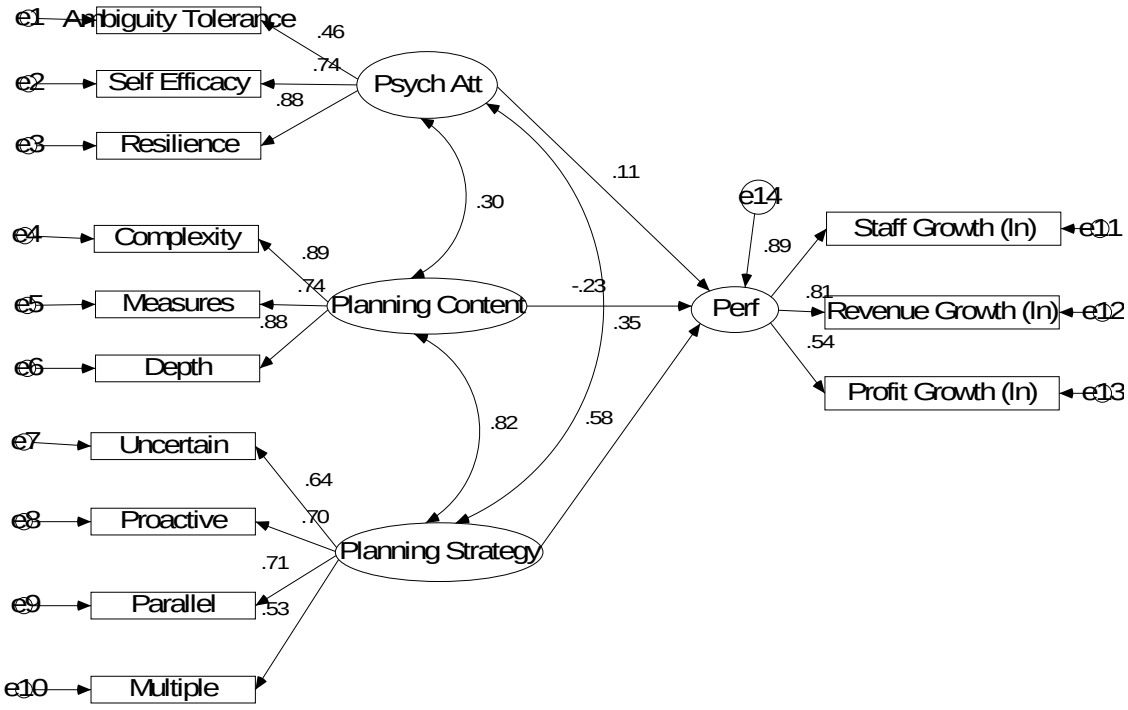


Figure 12: Structural model based on Figure 7

In an attempt to improve path coefficients and potentially goodness of fit exploratory model refinement was undertaken. After reviewing both LM and W tests it was decided that no manifest indicators needed to be added or removed from the model. Given the poor path coefficient of psychological attributes and performance the decision was made to remove this path from the model. The second hypothesised model (Figure 8) inferring an indirect or moderating relationship between psychological attributes and performance was now tested. Doing this increased the path coefficient of planning strategy and performance to 0.66 which is considered to be 'very good' in the literature (Comrey and Lee, 1992). There was also a slight improvement in the path coefficients of the manifest indicators related to planning content and strategy. The only sacrifice was a slight decrease in overall GFI from 0.952 to 0.951. This was considered an acceptable decrease given the improvement in the planning path coefficients. The paths between psychological attributes and planning remained as these are theoretically supported and also improved goodness of fit. The final structural model is shown on the following page (Figure 13).

Model	**Goodness of Fit Indices**			
	GFI	AGFI	CFI	RMSEA
Original Model (x^2 = 126.21; *df* = 59)	.95	.92	.96	.05
Final Model (x^2 = 128.93; *df* = 60)	**.95**	**.93**	**.97**	**.05**

Table 4.11 Goodness of Fit Statistics for Original and Final Structural Models

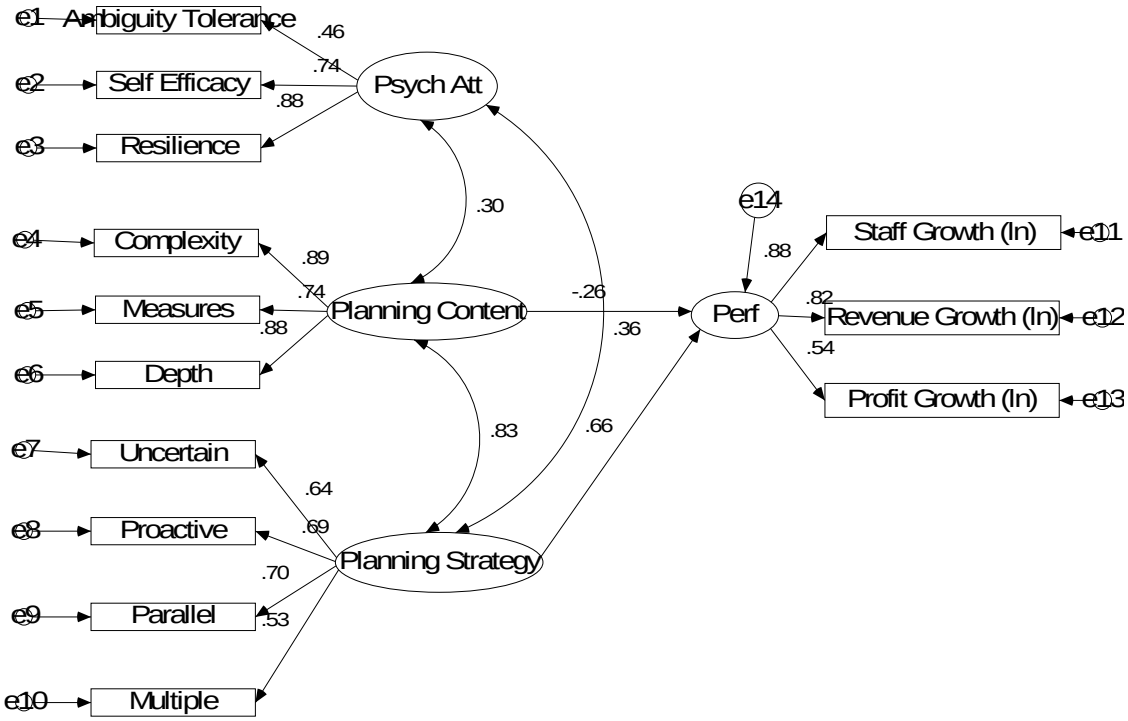


Figure 13: Final structural model based on Figure 8

Comparison between the original and final model chi-squares was only significant at $p > .01$ ($\Delta\chi^2 = 2.72$; $\Delta df = 1$). The final structural model achieved good fit on all criteria according to Byrne (2001). It is now acceptable to proceed with a brief interpretation of the model. A more detailed interpretation is provided in chapter five.

The path coefficients in the final structural model ranged from poor to excellent using the criteria established by Comrey and Lee (1992). The most significant coefficient, from a theoretical standpoint, is the very good path coefficient between planning strategy and performance latent factors (0.66), with good path coefficients across the various manifest indicators related to planning strategy (0.53 – 0.7). The path coefficient between planning content and performance was poor at -0.26. The path coefficients between the performance latent factor and its path coefficients were excellent in respect to staff and revenue growth (0.88 and 0.82) and fair in respect to profit (0.54). The path coefficients of the manifest indicators related to psychological attributes and planning content were generally excellent (0.74 to 0.88) with the exception of ambiguity

tolerance which was fair (0.46). The path coefficients between the independent latent factors was generally poor (0.3 and 0.36) with the exception of an excellent path between planning content and strategy (0.83).

4.3.8 Conclusion

The data set used for this analysis has presented few problems in general analysis. There was no missing data, with the exception of demographic data, which was not included in the final analysis. The various psychometric scales used all demonstrated good alpha levels and presented few issues in respect to factor analysis and measurement modeling. The data generally met all assumptions of normality with the one exception being the performance data; however this is commonplace in organisational research (see chapter three for further discussion). Overall, the second hypothesised theoretical model (Figure 8, chapter two) received generally good support from the data using an SEM approach for analysis. Clearly this thesis has not applied a purely confirmatory approach with a few small model refinements applied to obtain the final structural model. While these changes were exploratory they did not greatly digress from the literature and established theory discussed in chapter two. The only significant change from the hypothesised models in chapter two was the removal of the width manifest indicator, due it creating excessive noise in the measurement model. One disappointment was the low path coefficients between various latent constructs; so whilst the structural model has good general fit with the data, hypothesis testing and conclusions regarding the relationships of particular variables is going to be somewhat limited. A comprehensive discussion of the implications and conclusions will follow in chapter five.

4.4 Conclusions regarding hypotheses

This section will discuss specific findings from chapter four relating to hypotheses stated in chapter two. Each hypothesis will be restated, a general conclusion presented and then justification for this conclusion provided. The findings will then be contrasted against the literature discussed in chapter two.

4.4.1 $H1^{AT}$ and $H2^{AT}$

H^{1AT}: The ambiguity tolerance of the key organisational decision maker will be directly positively associated with firm financial performance.

H^{2AT}: The ambiguity tolerance of the key organisational decision maker will be indirectly positively associated with firm financial performance.

After consideration of the final structural equation model (Figure 12) and correlation matrix of variables (Table 4.8), this thesis concludes that there is no significant direct association between the ambiguity tolerance (AT) of key organisational decision makers and firm financial performance. This conclusion is supported by a low path coefficient (0.46) between AT and the psychological attributes latent variable and no significant path being found between the psychological attribute latent variable and the performance latent variable.

In support of an indirect association, the correlation matrix indicated a significant (p<0.01) positive correlation between AT and staff growth of 0.19. However this correlation is low. It is possible that AT does act to moderate the planning strategy latent variable, as removal of AT lowered the final structural model GFI from 0.95 to 0.93 indicating that AT does contribute to overall model fit. However the low path coefficients at both a measurement and structural level still indicate no significant direct relationship. This thesis therefore rejects hypothesis ***$H1^{AT}$*** that there is a direct association between AT and firm financial performance, but finds support for ***$H2^{AT}$*** that there is an indirect association between the constructs.

This finding is generally consistent with the majority of findings identified in the literature discussed in chapter two. Studies by Ashford (1988), Frone (1990), Furnham and Ribchester (1995), Gupta and Govindarajan (1984), Judge, Thoresen, Pucik and Welbourne (1999), Lefebvre and Lefebvre (1992), Schere (1982), Westerberg, Singh and Häckner (1997) have all concluded that there was a general positive association between AT and firm performance. The majority of these studies were conceptual or qualitative in orientation and did not investigate the precise nature of the association, but are in

agreement with this thesis in respect to the general association of the concepts. Some studies have argued a direct association between AT and performance. The study by Westerberg, Singh and Häckner (1997) found a direct association between AT and firm performance (r=0.26, p<0.1). The reasons for this inconsistency could be related to the different research contexts with AT being more important in larger organisations or other jurisdictions; however this is somewhat unlikely as an ability to tolerate ambiguity should have universal benefits. Another consideration with respect to this inconsistency is the poor performance of the AT measure used in this study. As discussed in chapters three and four the AT scale selected for this thesis only just achieved the minimum acceptable alpha value of 0.7. The scale also performed poorly in factor analysis as discussed in chapter four, with six factors being extracted using the oblique rotation method. Likewise the study by Westerberg, Singh and Häckner (1997) utilised a study specific scale which only achieved an alpha value of 0.54. The reliability of the AT measure in the Westerberg, Singh and Häckner (1997) study is therefore questionable given the poor alpha score.

This finding was expected. Even though finding a direct association would have been ideal, finding a direct association between a specific psychological attribute and firm financial performance is unlikely. This may be due to the overpowering influence of macro environmental factors over the performance of an organisation. It is however encouraging to find an indirect association; with AT acting to moderate the general planning strategy of the organisational decision maker. As discussed earlier in this chapter and throughout chapter four, planning strategy is directly associated with firm performance. Even though the path coefficients are small between AT and planning strategy, AT does contribute to overall model fit. So while there is an indirect association, more research is required to fully understand the effect size and nature of this association.

4.4.2 $H3^{AT}$

H^{2AT}: The ambiguity tolerance of the key organisational decision maker will be positively associated with self efficacy.

After consideration of the final measurement model (Figure 9) and correlation matrix of variables (Table 4.8) this thesis suggests that there is a positive association between AT and self efficacy (SE). This conclusion is supported by fair to excellent path coefficients between the constructs and the latent variable of psychological attributes and a moderate correlation of 0.3 (p<0.01).

This conclusion is consistent with the general literature cited in chapter two. Studies by Audia, Locke and Smith (2000), Bandura (2001), Judge, Thoresen, Pucik and Welbourne (1999), Lane and Klenke (2004) and Westerberg, Singh and Häckner (1997) all indicate or conceptualise a positive association between the psychological traits. As detailed in chapter two Judge, Thoresen, Pucik and Welbourne (1999) considered seven dispositional traits and their influence over coping with organisational change. Significant inter-correlations were reported between AT and self efficacy, self-esteem, openness to experience, risk aversion and positive affectivity. The results indicated a positive correlation of 0.57 (p<0.05) between AT and self efficacy. Westerberg, Singh and Häckner (1997) also cited a positive path coefficient of r=0.33 (p<0.01) between AT and self efficacy.

4.4.3 $H1^{SE}$ and $H2^{SE}$

H^{1SE}: The self efficacy of the key organisational decision maker will be directly positively associated with firm financial performance.

H^{2SE}: The self efficacy of the key organisational decision maker will be indirectly positively associated with firm financial performance.

The final structural equation model (Figure 12) and correlation matrix of variables (Table 4.8) concludes there is no direct association between the self efficacy (SE) of key organisational decision makers and firm financial performance. This conclusion is supported by no significant path being found between the psychological attribute latent variable and the performance latent variable. SE did have an excellent path coefficient (0.74) with the psychological attribute latent construct, which acts to moderate the planning strategy latent construct that does have a significant path coefficient to

performance. Therefore SE may indirectly moderate performance through influencing the planning strategy latent construct. Possible interpretations underlying this moderating relationship are offered in section 5.1. The correlation matrix did indicate a significant (p<0.01) positive correlation between SE and staff growth of 0.25, however this correlation was low.

This thesis therefore rejects hypothesis $\boldsymbol{H1^{SE}}$ that there is a direct association between SE and firm financial performance, but finds support for $\boldsymbol{H2^{SE}}$ that there is support for an indirect association between the constructs.

This conclusion is generally consistent with the general findings of the literature identified in chapter two. Studies by Bandura (1997), Bandura and Dweck (1988), Bandura and Jourden (1991), Bandura and Wood (1989), Dörner and Pfeifer (1990), Dörner and Schaub (1994), Jatulis and Newman (1991), Jenkins (1994), Jourden (1991), Judge, Thoresen, Pucik and Welbourne (1999), Krueger and Dickson (1993, 1994), Rigas and Elg (1997), Schaub and Strohschneider (1992), Stajkovic and Luthans (1998), Wood and Bandura (1989), Wood, Bandura and Bailey (1990) and Wood and Locke (1990) all indicate a positive association between SE and some measure of firm performance. The general conclusion of these studies is that there is a positive association between the constructs. Most of these studies also suggest that the relationship between the constructs is an indirect moderating process through influencing analytic (Wood and Bandura, 1989) and various decision making routines (Dörner and Schaub, 1994; Judge, Thoresen, Pucik and Welbourne, 1999).

This consistency is expected given the variety of research settings and designs that have identified a positive association between SE and firm performance. In some studies (Baum, 1994; Jatulis and Newman, 1991; Rigas and Elg, 1997; Wood and Bandura, 1989) this relationship was also suggested to be direct. However, this study did not find a direct positive association between SE and performance. The most likely possibility is the manner in which firm performance has been defined by this thesis. In most of the studies above firm performance has largely been assessed through subjective

measures, for example decision making effectiveness (Baum, 1994; Jatulis and Newman, 1991), entrepreneurial spirit and creative skill (Lucas and Cooper, 2005), problem solving ability (Rigas and Elg, 1997) and ability to manage decision making stress (Wood and Bandura, 1989). These measures were assessed in a more general fashion classifying participants as either creative or not. In contrast this research used quantitative measures of company financial performance which with a more specific measurement scale may have impaired the likelihood of finding a direct association.

Another potential reason for this inconsistency with particular past research could be related to the nature of the study design. In the case of research by Bandura and Jourden (1991), Dörner and Pfeifer (1990), Dörner and Schaub (1994), Schaub and Strohschneider (1992) and Wood and Bandura (1989), simulated organisational data was used for the dependent measures. In the case of simulated organisations, a large number of environmental variables can be controlled for, which cannot be controlled for when collecting actual performance data. For example in the simulated organisations all participants are subject to the same macro economic, regulatory and competition conditions whereas in the real world macro economic changes can effect organisations regardless of the decision making dispositions of the owner/operator. This finding was also in contrast to the findings of my master's thesis which concluded there was a positive association between SE and performance in a simulated organisation (Walley, 2004).

Finally, this inconsistency may also stem from the generality of the sample frame from which data was collected. Past literature has largely focused on sampling from a particular industry or regional locality, normally in an attempt to control for environmental variables. In this research I decided to adopt a generalist approach to investigate whether SE positively influenced firm performance regardless of environmental factors such as industry classification, macro economic factors, regional locality and so on. It is apparent from the difference between the findings of the general literature and the results of this thesis in chapter four, that the sample frame was potentially too general to identify any significant direct relationship between SE and firm

performance. SE therefore appears to act as a moderator of performance in organisations when other major environmental variables are held constant. This is discussed in more detail earlier in this chapter.

4.4.4 H3^{SE}

H^{3SE}: The self efficacy of the key organisational decision maker will be positively associated with resilience.

After consideration of the final measurement model (Figure 9) and correlation matrix of variables (Table 4.8) this thesis suggests that there is a positive association between SE and resilience (RES). This conclusion is supported by excellent path coefficients between the constructs and the latent variable of psychological attributes (0.74 and 0.88) and a high correlation of 0.66 (p<0.01).

This finding is consistent with the findings of research by Audia, Locke and Smith (2000), Bandura (1988), Bandura (1997), Pajares, (1997), Pajares and Miller (1994), Pajares and Schunk (2001), Robins and Beer (2001) and White (1982) which all indicate or conceptualise a positive association between the psychological traits of SE and RES. This finding was to be expected given the support from past literature and the intuitive link between the attributes. Refer to chapter two for a comprehensive discussion in regards to the past literature and the intuitive relationship of SE and RES.

4.4.5 H4^{SE}

H^{4SE}: The self efficacy of the key organisational decision maker will be positively associated with a preferable planning orientation.

The results of the final structural (Figure 12) and measurement (Figure 9) models and the correlation matrix (Table 4.8) provide partial support for this hypothesis. The correlation matrix reported significant (p<0.01) but low positive associations between SE and planning complexity (0.22), specificity (0.19), depth (0.2), width (0.27), certainty (0.27), control (0.18) and simultaneity (0.48 and 0.41). Structurally, the path coefficients in the final model between the psychological attributes latent and planning content and

planning strategy were reported at 0.30 and 0.36 respectively. Applying the criterion set by Comrey and Lee (1992), these path coefficients are of poor interpretable value and as such conclusions cannot be drawn based on the structural model. However, the presence of the paths between the latent constructs improved the goodness of fit statistics from 0.92 to 0.95 and CFI from 0.91 to 0.97, indicating that this association has some contribution to the overall model. In general, both the structural model and correlation matrix indicate a positive association between SE and preferable planning orientations. However, due to the smaller effect sizes of the correlations and inconclusive path coefficients in the final structural model this hypothesis cannot be fully supported.

This finding is to some extent a new contribution to the literature and therefore does not easily compare to past research findings. As discussed in chapter two, the relationship between SE and planning has not received much attention in the literature. Empirical and conceptual research by Bandura (1997), Locke and Latham (1984) and Wood and Bandura (1989) has suggested that planning orientation may act to moderate the influence of SE over performance. However, these studies have not investigated a direct relationship between SE and planning orientation. As stated in chapter two this lack of research is largely due to the variety of planning definitions in the literature with few studies opting to focus on the psychological elements of planning. The implications and contribution of this finding were discussed earlier in this chapter.

4.4.6 $H1^{RES}$ and $H2^{RES}$

H^{1RES}: The resilience of the key organisational decision maker will be directly positively associated with firm financial performance.

H^{2RES}: The resilience of the key organisational decision maker will be indirectly positively associated with firm financial performance.

After consideration of the final structural equation model (Figure 12) and correlation matrix of variables (Table 4.8) this thesis suggests that there is no direct association between the resilience (RES) of key organisational decision makers and firm financial performance. This conclusion is supported by no significant path being found

between the psychological attribute latent variable and the performance latent variable. RES did have an excellent path coefficient (0.88) with the psychological attribute latent construct, which acts to moderate the planning strategy latent construct that does have a significant path coefficient to performance. Therefore, RES appears to indirectly moderate performance through influencing the planning strategy latent construct. The correlation matrix did indicate a significant (p<0.01) positive correlation between RES and staff growth of 0.23 however this correlation was low.

This thesis therefore rejects hypothesis $\boldsymbol{H1^{RES}}$ that there is a direct association between SE and firm financial performance, but finds support for $\boldsymbol{H2^{RES}}$ that there is support for an indirect association between the constructs.

This conclusion is generally consistent with the majority of results of past literature discussed in chapter two. Although as identified in chapter two the investigation of the relationship between RES and firm performance has not received much attention in the literature to date. The findings of studies by Bunce and West, (1996), Bunker (1997), Conner and Hoopes (1997), Ferris (1998), Maddi (1999), Wanberg and Banas (2000), and Williams and Cooper (1998) all indicated a general positive association between RES and organisational performance. These studies all adopted a more qualitative methodology than the one used in this thesis. However most of the studies reported either subjective or anecdotal evidence of a relationship between RES and organisational performance. There has been limited research on the precise association between the constructs, be it direct or indirect. The only previous study to quantitatively investigate the relationship between RES and organisational performance was by Atwater, Dionne, Avolio, Camobreco and Lau (1999). This study concluded, through using stepwise regression, that there was no evidence to support a direct relationship between RES and organisational leadership effectiveness. The authors of this study did cite low variation in the independent measure of resilience as a possible reason for this result.

Clearly there are some areas of the literature which require further research with respect to the relationship between RES and organisational performance. Conceptually and intuitively one would expect a positive association to be present, with most qualitative research and the findings of this thesis suggesting this is the case. In addition, studies in other settings such as health recovery, learning and development have empirically proven this relationship. It may be that while there is some association or influence exerted by a psychological concept such as RES over performance, the actual size of the relationship is too small to isolate directly through quantitative methods. The direct influence of RES is therefore most likely overshadowed by external environmental and internal organisational factors. The relationship between RES and organisational performance is therefore likely to be indirect as suggested by the findings of this thesis. This finding is stated as it is intuitively difficult to believe that one single psychological attribute could act alone to influence the financial performance of an organisation. It is much more tenable to believe that RES moderates and influences the planning strategies applied by an organisational owner/operator, in turn influencing organisational performance. This finding is discussed in more detail earlier in this chapter.

4.4.7 $H3^{RES}$

H^{3RES}: The resilience of the key organisational decision maker will be positively associated with ambiguity tolerance.

After consideration of the final measurement model (Figure 9) and correlation matrix of variables (Table 4.8), this thesis suggests that there is a positive association between RES and AT. This conclusion is supported by fair to excellent path coefficients between the constructs and the latent variable of psychological attributes and a moderate correlation of .41 (p<0.01).

The findings of this thesis are in agreement with the findings of the literature. As identified in chapter two the relationship between RES and AT in organisational settings has been given limited attention in the literature. Most studies to date are qualitative in nature making subjective decisions regarding the relationship between the constructs.

Studies by Bass (1990, 1998), Bunker (1997), Connor and Hoopes, (1997), Harland, Harrison, Jones, Reiter-Palmon (2005) and Wanberg and Banas (2000) have investigated this relationship and generally concluded that there is some form of positive association between the two constructs in organisational settings. This research helps to strengthen the literature in respect to the relationship between these constructs, being the first quantitative study to demonstrate a statistically significant relationship.

4.4.8 $H1^{PO}$

H^{1PO}: The complexity and specificity of planning of organisational decision makers will be positively associated with firm financial performance.

The results of the final structural (Figure 12) and measurement (Figure 9) models and the correlation matrix (Table 4.8) do not support this hypothesis as a direct relationship. However this hypothesis is supported as a moderating relationship through the planning strategy latent variable. The measurement model indicates excellent path coefficients between complexity (0.89) and specificity (measures) (0.74) and planning content latent variable. Structurally the path coefficient in the final model between the planning content latent variable and firm performance was reported at -0.26. Applying the criterion set by Comrey and Lee (1992) this path coefficient is of poor interpretable value and as such statistically significant conclusions cannot be made based around the structural model. Interestingly this path coefficient was negative meaning that as complexity and specificity increase firm performance may actually decrease. This finding is similar to that of my earlier research which determined that a moderate level of planning complexity and specificity was preferable to high or low levels (Walley, 2004). The correlation coefficient does offer some support for a relationship between complexity and specificity and organisational performance. In respect to complexity significant coefficients (p<0.01) were identified with both staff (0.12) and revenue growth (0.2) and in regard to specificity and staff growth (0.21). These correlations while significant are low.

Complexity and specificity may still moderate organisational performance through the planning content latent variable having an excellent path coefficient to

planning strategy (0.83) latent variable, which is in turn has a very good relationship to organisational performance (0.66). The presence of the paths between the latent constructs significantly improved the goodness of fit statistics and path coefficients of the general model, indicating that this association has a contribution to the overall model. Therefore is appears that complexity and specificity through the planning content latent variable are moderating the planning strategy applied by organisational decision makers, which is then influencing organisational performance. It is therefore concluded that complexity and specificity are indirectly positively associated with organisational performance through moderating planning strategy.

Due to the quantitative methodology adopted in this thesis, this finding is to some extent a new contribution to the literature. As discussed in chapter two research related to the relationship between the cognitive elements of planning and organisational performance is an emergent field of research. As such minimal literature could be found that focused on assessing the relationship between the complexity and specificity of planning and organisational performance. Most research to date is either conceptual or anecdotal with respect to methodology and findings, with most studies suggesting that positive association between complexity/specificity and performance (Calori, Johnson and Sarnin, 1994; Diffenbach, 1982; Dörner, 1996; Dollinger, 1984; Güss and Strohschneider, 1996; Güss and Strohschneider, 1998; Huntsman, 1994; Miller, Burke and Glick, 1998; Streufert and Driver, 1965; Tuckman, 1964).

4.4.9 $H2^{PO}$

H^{2PO}: The depth and width of planning of organisational decision makers will be positively associated with firm financial performance.

The results of the final structural (Figure 12) and measurement (Figure 9) models and the correlation matrix (Table 4.8) do not wholly support this hypothesis as a direct relationship. However, elements of this hypothesis are supported as a moderating relationship through the planning strategy latent variable. As discussed in chapter four the width planning element created significant noise, due to a lack of variance, in the both

the final measurement and structural models and was subsequently removed from the analysis. As such the element of this hypothesis related to planning width is rejected. In respect to planning depth the measurement model indicates an excellent path coefficient of 0.88 to planning content latent variable. As discussed in the previous section structurally the path coefficient in the final model between the planning content latent variable and firm performance was reported at -0.26 as such statistically significant conclusions cannot be made based around the structural model. The correlation coefficient does offer some support for a relationship between depth and organisational performance. In respect to depth significant coefficients (p<0.01) were identified with staff (0.21), profit (0.14) and revenue growth (0.19). These correlations while significant are of small effect sizes.

In the same manner as complexity and specificity, planning depth may still moderate organisational performance through the planning content latent variable having an excellent path coefficient to planning strategy (0.83) latent variable, which is in turn has a very good relationship to organisational performance (0.66). The presence of the paths between the latent constructs improved the goodness of fit statistics from 0.93 to 0.95 and path coefficients of the general model from 0.38 to 0.66, indicating that this association has a contribution to the overall model. Therefore it appears that depth through the planning content latent variable are moderating the planning strategy applied by organisational decision makers, which is then influencing organisational performance. It is therefore suggested that planning depth is indirectly positively associated with organisational performance through moderating planning strategy. This hypothesis is partially accepted. A more detailed interpretation of this relationship follows in section 5.1.

As with $\boldsymbol{H1^{PO}}$ this conclusion presents a new contribution to the literature. No studies have quantitatively examined the influence cognitive planning depth has over organisational performance. To date studies by Barringer and Bluedorn (1999), Das (1987), Güss (1997, 2002), Güss and Strohschneider (1996) and Schwenk and Schrader (1993) have conceptualised and demonstrated a positive association between planning

depth and individual decision making performance in non-organisational settings. Therefore the findings of this study are in agreement with general findings of the literature cited in chapter two. However, this study is the first to quantitatively investigate the relationship in an organisational setting.

The lack of support for the influence of planning width is in direct contrast to the literature cited in chapter two. Various studies by Bloom and Menefee (1994), Evans and Elphick (2005), Lorange (1996), Miesing and Wolfe (1985), Mitroff (1988), Paton (2003) and Waldersee and Griffiths (2004) all expressed support for the notion that increased consideration of planning contingencies positively influenced performance. The discrepancy in the outcomes of this study and the past literature may again be attributed to the quantitative methodology employed in this study. The findings of the literature cited in chapter two largely stemmed from studies adopting qualitative designs with conclusions regarding the significance of planning width being based around interpretation of observations. While these findings are intuitive, they were not statistically supported. Increased consideration for planning contingencies may therefore enhance organisational decision-makers planning effectiveness but not to the extent that it actually influences organisational financial performance.

4.4.11 $H3^{PO}$

H^{3PO}: Increased planning certainty by organisational decision makers will be negatively associated with firm financial performance.

After consideration of the final structural model (Figure 12) and correlation matrix of variables (Table 4.8) this thesis suggests that there is a significant negative association between increased planning certainty and firm financial performance. This conclusion is supported by a very good path coefficient between the planning strategy and performance latent variable (0.66), a very good path coefficient between the uncertain manifest indicator and planning strategy (0.64) and a significant correlation with staff (-0.33), revenue (-0.3) and profit (-0.4) growth (p<0.01).

This finding is largely a new contribution to the literature. In respect to the literature cited in chapter two the findings of this thesis are in agreement. As discussed in chapter two the majority of research regarding the influence of planning orientation (or similar concepts) over organisational performance has largely been conceptual or merely focused on the difference between the absence or presence of formalised planning. Limited research by Blackman and Henderson (2004), Combe and Greenley (2004) Dörner (1996), Güss (1997), Güss and Strohschneider (1996), Mintzberg (1993) and Reeder (1995) have all suggested the idea that planning uncertainty is positively associated with individual problem solving ability and organisational performance. Of these studies only Güss (1997) and Güss and Strohschneider (1996) conducted empirical research regarding the influence of planning uncertainty over individual decision making performance. Both of these studies concluded that a positive association was present between planning uncertainty and decision making effectiveness. Neither of these studies were focused on organisational financial performance.

4.4.12 $H4^{PO}$

H^{4PO}: Increased control in planning by organisational decision makers will be positively associated with firm financial performance.

After consideration of the final structural model (Figure 12) and correlation matrix of variables (Table 4.8) this thesis suggests that there is a significant positive association between increased planning control and firm financial performance. This conclusion is supported by a very good path coefficient between the planning strategy and performance latent variables (0.66), a very good path coefficient between the proactive control manifest indicator and planning strategy (0.69) and a significant correlation with staff (0.18), revenue (0.15) and profit (0.21) growth (p<0.01).

As with ***H3^{PO}*** this finding presents a new contribution to the literature. Although in comparison to planning certainty, the influence of planning control has received some reasonable attention in the past literature. As identified in chapter two the manner of defining planning control has some variety, with control often relating to different

organisational elements, for example control over planning process, individuals, strategic direction or the environment. Of interest to this research was the influence of control over planning processes and how an individual's perception of their control changed the direction and manner of their plan scenario responses. Past literature discussed in chapter two has generally indicated a positive association between proactive control and performance. The results of this research are therefore in agreement with the past literature. Studies by Anderson (1977), Boone and De Brabander (1993), Khan and Manopichetwattana (1989), Miller (1983), Miller, Kets de Vries, and Toulouse (1982), Miller and Toulouse (1986) and Wang and Chan (1995) discussed the relationship between planning and organisational decision making effectiveness and performance. These studies all concluded that there was good evidence to support proactive planning processes (or equivalent concept) and a positive association to performance and decision making effectiveness. These studies were however limited in that they only conceptualised the relationship between the concepts from anecdotal data and observations. This study is therefore the first study to quantitatively demonstrate a relationship between cognitive planning control and organisational performance.

4.4.13 $H5^{PO}$

H^{5PO}: Increased simultaneity in planning by organisational decision makers will be positively associated with firm financial performance.

As explained in the previous chapters simultaneity was identified by two manifest indicators, one indicating the number of variables considered (multiple or singular) the other indicating the order or their consideration (parallel or serial). In order for a participant to be planning simultaneously they needed to plan in both parallel and multiple manners.

The final structural model (Figure 12) and correlation matrix of variables (Table 4.8) indicate that there is a significant positive association between increased planning simultaneity and firm financial performance. This conclusion is supported by a very good path coefficient between the planning strategy and performance latent variables

(0.66), a very good path coefficient between the parallel manifest indicator and planning strategy (0.7) and a good path coefficient between the multiple manifest indicator and planning strategy (0.53). Significant correlations were found between the parallel manifest indicator and staff (0.22), revenue (0.17) and profit (0.23) growth and between the multiple manifest indicator with staff (0.2) and revenue (0.21) growth.

In the same manner as the previous two hypotheses related to the planning strategy latent variable, this result also presents a new contribution to the literature. The concept of cognitive planning priority has the most limited attention in the literature of all concepts considered in this research. Chapter two identified three studies that have considered whether prioritising ability is an inherent cognitive disposition of a decision-maker (Güss, 2002; Strohschneider, 2002; Walley, 2004). The studies by Güss (2002) and Strohschneider (2002) were focused on identifying cross cultural differences in planning strategies. These studies concluded that individuals who applied a simultaneous (multiple and parallel) approach to planning demonstrated higher individual decision making effectiveness. Earlier Masters' work by the researcher concluded that a simultaneous planning orientation was preferable when operating a complex behavioural simulation (Walley, 2004). All three studies concluded that planning simultaneously was preferable in complex problem situations; however, none of the studies investigated the relationship between simultaneity and performance in the real world. In addition only my earlier Masters research was slightly related to an organisational context. This study is therefore the first study to quantitatively demonstrate a relationship between cognitive planning simultaneity and organisational performance.

Chapter Five

- Conclusions and Implications

5.0 Conclusions and Implications

The primary goal of this thesis was to determine if there is an association between the psychological attributes of ambiguity tolerance, self efficacy, resilience and planning orientation in owner/operators and the financial performance of small to medium sized New Zealand organisations. To assist in answering this question this thesis has been presented in five chapters. The first chapter presented a general overview of this research and the background literature along with a detailed justification for its importance within the relevant fields of research. The second chapter further developed the overview of the background literature, providing a thorough discussion of past research related to the four independent constructs of ambiguity tolerance, self efficacy, resilience and planning orientation. Hypotheses related to each construct were developed from the existing literature and presented at the end of each section. The third chapter focused on documenting the research methodology applied in this thesis. Justification was provided for the selection of measurement methods in relation to both independent and dependent variables. Finally an overview and justification of the data collection and analysis process was provided, ensuring that the constructs identified in chapter two and the purpose of the research identified in chapter one were being appropriately tested. The fourth chapter presented the results of the data analysis. An explanation and justification of all statistical techniques applied was provided. All scale measures selected in chapter three were tested to ensure reliability and acceptable factoring. The primary analysis technique employed structural equation modeling (SEM). The hypothesised model from chapter two was tested using SEM at both a measurement and structural level. Finally, the conclusions of this thesis in relation to the specific hypothesis identified in chapter two were presented.

This final chapter will discuss the conclusions and implications of the results identified in chapter four. This chapter is broadly split into five sections. The first section will provide a direct answer to the primary research question in consideration of the conclusions regarding each hypothesis. This section will also provide an overview of the contributions and conclusions of this thesis. The second and third sections will

present the implications of these conclusions in relation to theory and practice. Finally directions for future research will be provided.

Briefly, the results of this research indicate good support for the hypothesised relationships between the independent variables of ambiguity tolerance, self efficacy, resilience and planning orientation. The latent constructs of the independent and dependent measurement models indicated by the independent and dependent variables are well supported. However, at a structural level not all hypotheses are supported regarding the direct relationship between the psychological attributes and firm performance. The hypothesised relationship between firm performance and the attributes of ambiguity tolerance, self efficacy and resilience was only indirectly supported structurally and in the correlation matrix. Support for a direct relationship between firm performance and planning orientation is well supported structurally and in the correlation matrix. The following sections of this chapter will discuss these conclusions and their implications in detail.

5.1 Conclusions regarding the research problem

"Do the psychological attributes of ambiguity tolerance, self efficacy, resilience and planning orientation in owner/operators influence the financial performance of small to medium sized New Zealand organisations?"

The purpose of this section is to provide a general conclusion to the thesis research question based on the hypotheses conclusions above and summarise the contributions of the thesis. Overall, it is concluded that the primary research question of this thesis is partially accepted to be true. In the case of the ambiguity tolerance, self efficacy and resilience of owner/operators it is concluded that there is no direct influence over financial performance in New Zealand SME organisations. Instead it is concluded that these psychological attributes do exert an indirect moderating influence over financial performance through moderating the planning strategy latent variable. Despite being supported statistically by correlation coefficients and in the final structural model this relationship does require further investigation. In respect to the psychological

attribute of planning orientation it is concluded that there is a direct positive influence over the financial performance of New Zealand SME organisations when owner/operators possess preferable planning orientation characteristics. This relationship was supported by very good path coefficients in the final structural model. The main findings and conclusions of this thesis can be broadly divided in major and minor conclusions, based around the significance and strength of their theoretical and practical implications.

Major conclusions of this thesis are as follows; (1) there is a direct positive association between preferable planning orientation types and organisational financial performance. (2) There are clear planning typologies identified for financially successful owner/operators. (3) Planning content was not directly associated with performance, whilst planning strategy was directly associated. (4) There is only an indirect positive relationship between the psychological attributes of AT, SE and RES and firm financial performance. (5) Minor conclusions of this thesis relate to the relationships between the various psychological attributes. An in depth discussion of these conclusions follows.

The most significant finding of this thesis relates to the direct positive relationship between planning strategy and organisational financial performance. The path coefficient representing this relationship in the final structural model was 0.66, which is considered to be very good by the literature (Comrey and Lee, 1992). As indicated by Comrey and Lee (1992) a relationship of this strength is adequate to suggest a causal relationship between the latent constructs. This study therefore concludes that the planning strategy of owner/operators directly influences the financial performance of their organisation. Given the statistical strength of this finding it presents a number of implications for theory and practice. These implications will be detailed later in this chapter. This section will discuss and present an understanding of this finding. An organisational decision-makers ability to plan effectively to improve organisational performance has received a degree of interest in the literature. However, to date minimal research has investigated the overall planning strategy applied by organisational owner/operators at a cognitive level. This study has concluded that the cognitive planning strategy of organisational

owner/operators has a significant and direct impact on the financial growth and success of their organisation. This conclusion is of particular significance as it suggests that the financial success of organisations is somewhat determined by the subconscious planning characteristics of owner/operators. This implies that SME organisations are highly reliant on the decision-making and problem-solving competence of owner/operators. In effect the decisions made by the organisation are largely those made by the owner/operator with minimal influence from other elements of the organisation. If the owner/operator is proactive in their decision-making, viewing their environment as uncertain and likely to change and therefore putting in place plans and strategies to address this uncertainty, the organisation will also adopt these positive planning and decision-making characteristics. This finding has illustrated that in SME's, the individual level decision-making and psychological characteristics of the owner/operator can have a direct and significant impact on organisational performance. Thus demonstrating the dependence SME's often have on the competence of the owner/operator of the organisation.

The second major conclusion of this study relates to the identification of a preferable planning strategy typology. The planning strategy of an individual comprises of three main planning elements, certainty, control and simultaneity (Güss, 1997). As detailed in chapter three, simultaneity is assessed using two dichotomous variables while certainty and control are assessed with one. All planning elements were found to be positively associated with the planning strategy latent variable. This indicates a positive association between all planning elements. This study has identified that individuals who plan in an uncertain, proactive and simultaneous (multiple and simultaneous) manner generally operate organisations which indicate higher levels of financial growth. The positive association between the elements also suggests that an individual usually possesses all positive planning strategy elements.

The first element, planning certainty, relates to the individuals willingness and ability to question the context of problem situations and their general environment (Güss, 1997; Walley, 2004). Individuals who operated more financially successful organisations usually possessed an uncertain planning strategy orientation. An uncertain orientation

indicates that the individual questions and seeks a thorough understanding and meaning of their environment, and the demands associated with various elements of the problem, before acting on them and formulating a plan (Walley, 2004). A trait such as this in a planning context will tend to lead individuals to seek out information before making decisions, checking to ensure that information and perceptions regarding the problem are correct, and being cautious to plan for contingencies and unexpected changes in the problem situation. In contrast individuals with a certain orientation tend to accept the problem situation as stable and fixed (Walley, 2004). They will not question the validity of the problem situation or any individual's understandings and perceptions of it (Güss, 2002). This could potentially lead to rigid and inflexible planning that cannot be adapted if the problem situation changes, the plan may be based around unsubstantiated information or make assumptions in regards to the environment. In an organisational context, it is desirable that an individual would seek out an understanding of any problem situation they are presented with, before formulating a plan of action to resolve the problems of interest. Therefore the conclusion regarding the relationship between uncertain strategic planning and organisational performance is largely intuitive.

The second element, planning control, indicates the individuals' perceived level of control in respect to the problem situation and wider environment (Güss, 1997). Individuals are either classified as proactive or reactive. This study concludes that owner/operators who apply a proactive approach to planning generally operate organisations with higher levels of financial growth. A proactive planning orientation indicates that the individual considers and plans for problems which are not of immediate urgency but may still be important to the wider problem environment (Walley, 2004). Applying this approach to planning strategy allows the individual to resolve not only the problem but also potential causes of the problem. Individuals who applied a proactive approach in the planning scenarios were also more mindful of their solutions creating new problems; demonstrating a greater consideration for the likely consequences of their actions. In contrast reactive individuals only plan to resolve problems of immediate threat or urgency (Walley, 2004). These individuals largely focus on addressing the immediate issues presented in the problem situation, often addressing sub-elements of

problems based around perceived urgency and not actual importance. This can lead to disproportionate amounts of resources spent resolving urgent but non-important problems. From an organisational perspective it is intuitive to expect proactive planning to improve financial performance. Individuals applying this perspective demonstrate a greater awareness of the consequences of their actions. They also appear to focus on the important elements of the problem, to some extent disregarding the non-important yet urgent elements of the problem. In an organisational context the ability to see the important but non-urgent problems is often very difficult. This is due to the excess noise generated by, and attention urgent problems often demand. This noise can often be amplified by other individuals who have a reactive orientation. Having an organisational owner/operator with a proactive orientation can provide an organisation with the ability to see important issues despite environmental noise. An organisation with a proactive owner/operator will likely focus efforts and resources in a more appropriate manner for long-term growth, rather than simply addressing each problem as it arises.

The third planning element, simultaneity, relates to how many problems an individual considers at one time, and whether the problems are addressed in a serial or simultaneous manner (Güss, 1997). Individuals who developed plans based around simultaneously addressing the various sub-elements of the problem generally operated more financially successful organisations. A simultaneous planning orientation describes an individual who structures their plan to consider multiple planning elements at the same time (Güss, 1997). This approach to planning allows the individual to multitask between the various demands of the planning situation ensuring that all problem issues are addressed. Individuals who exhibit a simultaneous planning trait also demonstrate a greater propensity to delegate tasks to competent subordinates to ensure that all issues receive attention. Typically these individuals retain a good general oversight of the planning activities, checking on each problem sub-element at set intervals. In contrast individuals who applied a serial or singular planning orientation focused either on addressing each problem element before progressing to the next, or they only considered one element total. These approaches often resulted in fragmented or incomplete planning solutions. Sequential planners were often unwilling to delegate activities and applied a

rank order of importance to the problem elements, normally based around their perceived urgency of the problem elements. Singular planners presented very shallow plans that only addressed a select few elements of the problem situation. In an organisational setting, it is preferable for an individual to demonstrate the ability to address multiple problem elements simultaneously, delegating activities effectively to sub-ordinates. This will allow for more efficient planning and problem solving, and also ensure that all important elements of the problem are addressed, and not disregarded, as often happens when individuals possess a singular orientation.

The third major finding of this study was the lack of direct association between planning content and performance. Instead planning content only exerted an indirect influence over performance through moderating the planning strategy of the participant. This conclusion is of some interest as it demonstrates the precise details of an individuals planning approach are not as important as general strategy when considering influences on organisational financial performance. This finding is largely intuitive as you would expect overall planning strategy to be more important than the specific details of planning. Curiously, the actual details of planning in organisational settings have usually been the primary focus in past literature, with minimal attention given to the underlying cognitive approach applied by the individual. The findings of this study suggest that cognitive planning should be receiving more attention in the literature when investigating the relationship between planning and organisational performance. The moderating relationship between the two latent constructs of planning detail strategy was positive, indicating that higher levels of planning complexity, specificity and depth are more commonly associated with the preferable planning strategy characteristics discussed above. For example individuals who possessed an uncertain orientation typically exhibited high levels of complexity, specificity and depth. This finding is consistent with the results of earlier Masters Thesis research discussed in section ***2.4*** (Table 2.1).

The final major finding of this thesis is the lack of support for a direct association between psychological attributes and organisation financial performance. This finding was surprising as it is largely contrary to earlier studies in the area. To date the majority

of studies involving the psychological attributes of AT, SE and RES have suggested significant relationships between the attribute of interest and some measure of organisational performance. There are, however, a number of differences in the design of the present study and past literature that may substantiate the reason for the difference in results. First, earlier studies were largely administered to specific organisational settings; focusing on specific industries, organisational sizes or organisational structures. In some cases studies have used experimental simulated settings that control for most extraneous variables. In contrast this study has utilised a more general sample frame. Second, other studies have used more qualitative and often subjective measures for organisational performance; for example opinions of growth, customer satisfaction and employee fulfillment. This study has focused on non-adjusted financial performance measures. These measures were more specific and avoided classifying organisations into general performance bands as was used in earlier studies. The classification of companies into general performance bands can often have the effect of smoothing data and improving goodness of fit statistics. Third, earlier studies often adjusted figures for macro-economic changes or environmental changes in the specific sample frames of interest. This study opted not to adjust for these changes, in order to determine effect sizes of the attributes in a real world setting. Given these differences with earlier studies, this thesis concludes that the psychological attributes of AT, SE and RES did not show a significant direct effect on organisational performance, due to the actual effect size of these attributes being small relative to other organisational and environmental factors.

This study did however find that the psychological attributes of interest did moderate planning strategy, which does have a direct relationship with organisational performance. Therefore, AT, SE and RES do act to directly moderate planning strategy and therefore indirectly moderate organisational performance. This finding is supported by the improved overall structural model fit statistics when the psychological attributes latent variable remains in the final model (GFI improvement from 0.86 to 0.95). There is also some limited support in the Pearson's correlations between AT, SE, RES and the planning strategy elements. The range of strength of the correlations is from low to moderate (0.15 – 0.27) for this type of study. The moderate correlations were found

between SE and uncertainty (0.27), AT and certainty (0.26), and RES and certainty (0.24). These correlations were to some extent lowered by the variability in both the independent psychological attribute scales and the dependent performance measures. A general review of the psychological attributes against the preferable planning strategy orientations found the following; usually individuals who demonstrated an uncertain, proactive and simultaneous planning orientation also indicated high levels of SE and RES and moderate levels of AT. This finding is to some extent a new contribution to the literature, given the lack of planning strategy discussion to date. However the general direction of the findings is congruent with the relevant bodies of literature identified in chapter two. As discussed in chapter two AT, SE and RES have all proven to have positive effects on performance in a wide variety of settings. The reasons relate to, amongst others, an individual's ability to learn from mistakes, tolerate uncertainty and demonstrate confidence from past successes. Likewise an individual with an uncertain, proactive and simultaneous planning orientation has also been found to exhibit higher levels of performance in complex problem solving situations (Güss, 1997, 2002; Walley, 2004). Therefore a positive association between AT, SE, RES and planning strategy is to be expected. This thesis will now offer some potential insights into the meaning behind these relationships. Given the lack of past literature in this area these insights are largely the authors' interpretations of the data. Further research in explaining and understanding the precise nature of these relationships is required.

With respect to the relationship between AT and planning strategy, it is intuitive to expect that AT would act to moderate an individuals' cognitive ability to apply an uncertain approach to planning. AT relates to an individual's ability to tolerate, and solve, problems in ambiguous and unknown situations (Budner, 1962). Planning uncertainty relates to an individuals' willingness to question and view their environment as uncertain, unknown and likely to change (Walley, 2004). Therefore, the moderating effect of AT is clear; as AT increases so will the individuals' desire and ability to seek out and cope with situations of ambiguity. It may be that individuals' with high AT view most situations they encounter as ambiguous and need to question the context of these situations. As stated by Furnham and Ribchester (1995) individuals with high AT will

actually seek out situations of ambiguity and uncertainty. The moderating effect of AT over uncertainty may therefore relate to the individuals willingness to question and view their environment as uncertain and ambiguous.

The relationship between AT and proactivity is also positive. Proactivity relates to an individual's ability to plan for important issues related to the problem environment that may be beyond the scope of the initial problem (Walley, 2004). Potentially, higher levels of AT could act to moderate this relationship through increasing the individuals' ability to cope with the uncertainty, and discomfort, of ignoring the urgent problems which are not necessarily important, instead focusing important but non-urgent problems. This type of action could lead to significant resistance from other individuals with reactive orientations involved in the problem situation. The individual would then need to tolerate further ambiguity through individuals questioning the justification for their priorities. Therefore AT may moderate an individuals' ability to apply, maintain and cope with the stresses associated with a proactive approach to planning.

Finally AT and simultaneity share a positive relationship. Simultaneity describes when an individual plans for multiple problem issues at the same time (Walley, 2004). As explained in this chapter and chapter two, individuals who plan with this orientation demonstrate a natural tendency to delegate tasks and leave responsibility with sub-ordinates. Delegation requires the individual to pass control, for a problem they may be responsible for, to another individual. Doing so can create a number of ambiguities; is the individual competent, can they be trusted, what happens if they fail, what happens if they report incorrectly. The individuals' willingness to tolerate the ambiguity associated with delegation and handling multiple problems simultaneously is likely to be moderated by their AT. Therefore as AT increases so to does the likelihood the individual will be comfortable with applying simultaneous planning strategies.

The relationship between SE and preferable strategic planning orientations is also positive. SE relates to the individuals underlying belief in their ability to handle and solve complex problem solving situations (Bandura, 1997). As explained in chapter two

SE is primarily determined by the success experienced by the individual in the past, their mastery of experience (Bandura, 1997). In respect to the planning certainty dimension there was a moderate positive association between uncertainty and SE. A general review of the raw data indicates that participants with an uncertain orientation always possessed a moderate high to high level of SE. One potential interpretation of this result is that an uncertain planning and problem solving approach usually leads to success. Therefore individuals with an uncertain orientation experience success more often, which increases their SE. Under this interpretation SE is acting more as a proxy for success, with an uncertain planning approach being used more often by successful individuals. This relationship may not have the same moderating effect as AT does over uncertainty. There is however the potential of a moderating relationship. As SE increases so does an individuals' willingness and confidence to question situations and apply new and novel problem solving strategies. Therefore increased levels of SE may allow an individual to be more comfortable in applying uncertain planning strategies. Clearly the causal nature of this positive relationship requires further investigation.

On face value the relationship between SE and proactivity was also generally positive, however not mutually inclusive like the relationship between uncertainty and SE. In most cases individuals who demonstrated proactive planning strategies also possessed high levels of SE. However participants with high SE did not always possess the proactive planning trait. It is somewhat intuitive to expect that individuals who apply a proactive approach to planning would also need to possess high levels of SE. Proactive approaches to planning require the individual to look beyond the basic scope of the problem and often broaden this scope to encompass new issues. Doing this creates more pressure and requires significantly more effort from the individual. The individual who applies a proactive strategy to planning would therefore need to have confidence in their ability to deal with the increased complexity and difficulty associated with applying this proactive approach. SE may therefore moderate an individuals' willingness to be proactive. There were, however, a number of high SE respondents who did not demonstrate a proactive approach to planning. High SE may therefore moderate an

individuals' willingness to apply a proactive strategy, but the relationship is weaker than that between SE and uncertainty.

The relationship between simultaneity and SE shares a general similarity with the SE/uncertainty relationship. Individuals with high SE largely apply simultaneous strategic planning approaches. Simultaneous planning approaches are more commonly applied by individuals who operate financially successful organisations. It is therefore expected that these individuals will also possess high levels of SE due to this success. SE may therefore simply be an indicator for an individual applying simultaneous planning strategies. Another interpretation could be that the increased difficulty and complexity of simultaneous planning strategies requires an individual to have a high degree of belief in their ability to adopt such a strategy. In this way high SE is moderating an individuals' willingness to apply a simultaneous planning strategy. Again the precise causal nature of the relationship requires further investigation.

The relationship between planning strategy and RES was positive and the strongest of the three psychological attributes. Despite this, given the lack of development of the RES construct in the literature, these findings are perhaps the most difficult to explain. RES refers to an individuals' ability to cope with and recover from psychological stressors, adapt to environmental demands, and apply corrective measures to decision-making routines when confronted with situations of adversity and stress (Maluccio, Pine and Tracy, 2002; Masten, 2001; McCubbin, Thompson, Thompson and Fromer, 1998; Richman and Bowen, 1997). Statistically there was a moderate positive association between planning uncertainty and RES. A general review of the data indicates that individuals who apply uncertain planning strategies usually possess high levels of RES. This relationship is very similar to the relationship between SE and uncertainty. This is expected given the high association between SE and RES (0.66). The reason for the relationship between these concepts is not as clear, given the lack of development in the literature and quantitative nature of this study. One possibility could be that an individual who has the ability to adapt to environmental demands and apply corrective decision-making behaviours, has learned the importance of questioning the

context of problem situations. Increased RES, in the same way as SE, may therefore only act as an indicator of uncertain strategic planning and not as a moderator.

RES also shares a positive relationship with proactive planning. This relationship was again very similar to SE and proactivity; most proactive individuals possessed high levels of RES, but not all high RES individuals planned in a proactive manner. The possible reasons underlying this relationship are more esoteric. Proactive approaches to planning require the individual to look beyond the basic scope of the problem and often broaden this scope to encompass new issues. This requirement in itself does not appear to have any specific relationship to the psychological attribute of RES. Intuitively there does not appear to be an explanation as to why an increase in an individuals' ability to cope with failure and apply adaptive strategies would moderate their willingness to apply a proactive planning strategy. It is possible that these traits are only associated due to them both sharing a positive relationship with general performance measures in the literature and in this study.

Finally RES and simultaneity also share a positive relationship. Statistically this relationship was only moderately supported given the variability in the RES measure results. However, when reviewing the raw data the majority of individuals who applied simultaneous approaches to planning also possessed high levels of RES. This relationship is somewhat similar to the relationship between RES and proactivity, in that there is no clearly intuitive reasoning as to why these concepts are related. One possibility is that individuals, who experience failure and learn to apply adaptive strategies to cope with complex situations, learn simultaneous planning as a coping method. Individuals with high RES may, therefore, apply the simultaneous planning strategies to ensure that any failures in particular areas can be coped with by successes in others. It is clear that further research is needed to investigate the precise reasons underlying the relationship between RES and the various cognitive planning strategies.

The findings of this thesis also contribute a number of minor conclusions regarding the relationships between the psychological attributes of AT, SE and RES. As

explained throughout chapter two the relationship between AT, SE and RES has been investigated to varying degrees in the literature. Largely the findings of the literature indicate positive associations between all of the attributes. The results of this study are congruent with the literature to date; that there is a positive association between AT, SE and RES. This study therefore contributes a new research setting to strengthen the validity of these relationships across a new research domain. With respect to the relationship between AT and RES this study is the first to quantitatively examine the relationship in a general research setting. This study makes a larger contribution in this area. Given the established nature of these attributes and the reliability of their measurement scales in the literature, it is not surprising that strong positive associations have been demonstrated. As explained in detail throughout chapter two it is intuitive to expect that these traits would all be positively associated. Conclusions regarding the specific hypothesis between the psychological attributes are discussed in chapter four.

The main contributions of this thesis' are as follows. (1) It has been proven that the planning orientation of owner/operators of New Zealand SME's, as measured in this thesis, shares a direct positive relationship with financial performance. As discussed in chapter two this study is the first to quantitatively examine the cognitive elements of planning and their relationship to the financial performance of an organisation. Given the statistical significance of the results in chapter four, there are implications for both theory and practice that are discussed later in this chapter. (2) The notion that AT, SE and RES are indirectly associated with firm performance through moderating planning orientation has been suggested. This contribution was interesting as this is the first study to quantitatively examine this relationship in relation to quantitative financial performance measures. (3) Positive associations between AT, SE and RES have been supported under an organisational research context. As discussed in chapter two these positive associations have been established in a wide variety of research domains, the findings of this thesis offer another context where this association has been confirmed. (4) When compared with simulated studies of a similar nature, it has become apparent that psychological attributes proven to be important in a simulated or controlled research context, may not exert a strong enough influence over performance to continue being

important in a real world context where macro environmental factors also influence performance. This finding is demonstrated by the discrepancy between the findings of this thesis and past research discussed in chapter two and my earlier masters' research regarding SE.

5.2 Implications for theory

This thesis presents a number of implications and contributions for theory. These implications relate to a number of immediate and parent disciplines. Immediate disciplines include the specific areas of theory associated with each independent measure of ambiguity tolerance, self efficacy, resilience and planning orientation. Other immediate disciplines where this thesis makes some contribution are related to human resource management training and selection theories and organisational entrepreneurship. Parent disciplines where the overall findings of this thesis make a contribution include organisational theory, organisational behaviour and cognitive and personality psychology. This section will first summarise the general contribution to the parent disciplines and then address specific contributions to various immediate disciplines listed before.

The main theoretical contribution is that it presents a model which demonstrates that the mental model processes related to strategy formulation of an organisations' owner/operator, have a significant influence over the financial performance of their organisation. This has been established by the significant association between psychological attributes, planning orientation and organisational performance. As discussed throughout chapter two the idea that the various psychological attributes investigated could influence organisational performance is closely related to concepts of mental models (Eysenck, 2001) and bounded rationality (Simon, 1997). Integrating the findings of this thesis into established frameworks related to mental models provides an explanation of how the psychological attributes and planning strategy are influencing organisational performance. This integration identifies where a contribution is made to the theoretical base of the parent disciplines. In order to frame this contribution a brief

background on mental model literature is provided with the findings of this study gradually incorporated into the existing body of knowledge.

There has been extensive research on mental models with different theoretical and practical perspectives being adopted by cognitive psychologists, economists and organisational theorists. Mental models are also referred to as mind sets, paradigms, archetypes, and schema/schemata (Marshall, 1995). Schema is particularly common with reference to the planning strategy elements of mental models.

The mental model concept originates from the field of cognitive psychology. Cognitive psychologists usually adopt an information processing approach to explain how individuals perceive their external environment (Eysenck, 2001). The information processing approach proposed a process whereby a stimulus is presented to an individual that captures their attention. The stimulus is then filtered through the individual's perceptions and thought processes to formulate a final decision and response to the stimulus (Eysenck, 2001).

The information processing approach provided the first insight into how the perceptions and thought process of individual's influenced their cognition of the external environment. This approach highlights the direct effect information processing can have over environmental perception, problem solving effectiveness, decision making ability and general behaviour. As explained in chapter one the strategic decisions of SME's are clearly governed by the information processing abilities of the owner/operator making those decisions. The information processing approach is illustrated in figure 13 below:

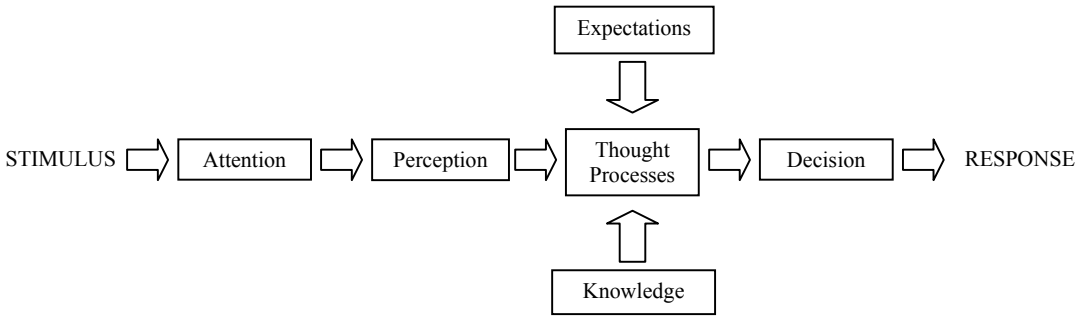


Figure 13: Information-processing approach – Adapted from Eysenck (2001)

Building on the information processing approach Kenneth Craik proposed the idea of a mental model in 1943 (Craik, 1943). Craik proposed that an individual's mental model is the manipulation of a vast variety of internal representations of the external world. Craik described mental models as a 'cognitive filter' which defines the way an individual perceives their external environment, filtering the information used to make decisions. He believed that mental models are critical in allowing individuals to simplify their environments. Without mental models individuals would be overwhelmed by environmental complexity. SME owner/operators are therefore placed in a situation where they must apply their mental models in order to simplify their decision making environment.

Later developments in cognitive decision making research argued that the importance of mental models is largely dependent on whether the problem facing the individual is well or ill-defined (March, 1988). Research was initially dedicated to understanding perceptual problem solving processes under the conditions of well-defined problems (Eysenck, 2001; Laszlo, Artigiani, Combs and Csanyi, 1996). In 1972 Newell and Simon developed the computational approach; the first widely accepted theory of how individuals solve well-defined problems. They concluded that individuals solve problems through the application of a number of rudimentary heuristic judgments such as means-end and gap analysis (Newell and Simon, 1972). The problem solving processes associated with well-defined problems were not thought to require the development of new mental models or application of existing detailed mental models. Instead computational processes were addressed through the usage of existing simplistic models. Computational analysis was later criticised for its knowledge lean problem structuring and lack of practical relevance (Chase and Simon, 1973). This prompted the development of ill-defined problem solving methods. These methods were argued to be largely dependent on an individual's ability to develop new mental models or modify existing detailed models to suit the ill-defined problem context (Chase and Simon, 1973). Template theory (Gobet and Simon, 1996) is the most influential ill-defined problem solving approach in cognitive psychology. Gobet and Simon (1996) developed template

theory to explain how individuals solve complex, dynamic and ill-defined problems through the utilisation of their memory (existing mental models) coupled with routine and adaptive expertise (developing mental models). Template theory provided an alternative to computational theory by acknowledging the need to modify the existing, and develop new mental models. The approach outlined by template theory helps to explain how the psychological attributes of interest to this thesis influence owner/operator decision making processes, and by association organisational performance. Figure 14 below helps to illustrate this influence through combining information processing, computational and template theories. The model illustrates that when an individual is confronted with a problem it first captures their attention. Based around existing mental models the problem is perceived to be ill or well defined. When ill-defined the individual must apply reasoning processes to reach a final decision. Reasoning processes are representative of the development of new mental models. New mental models are a surrogate of the relevant psychological attributes individual.

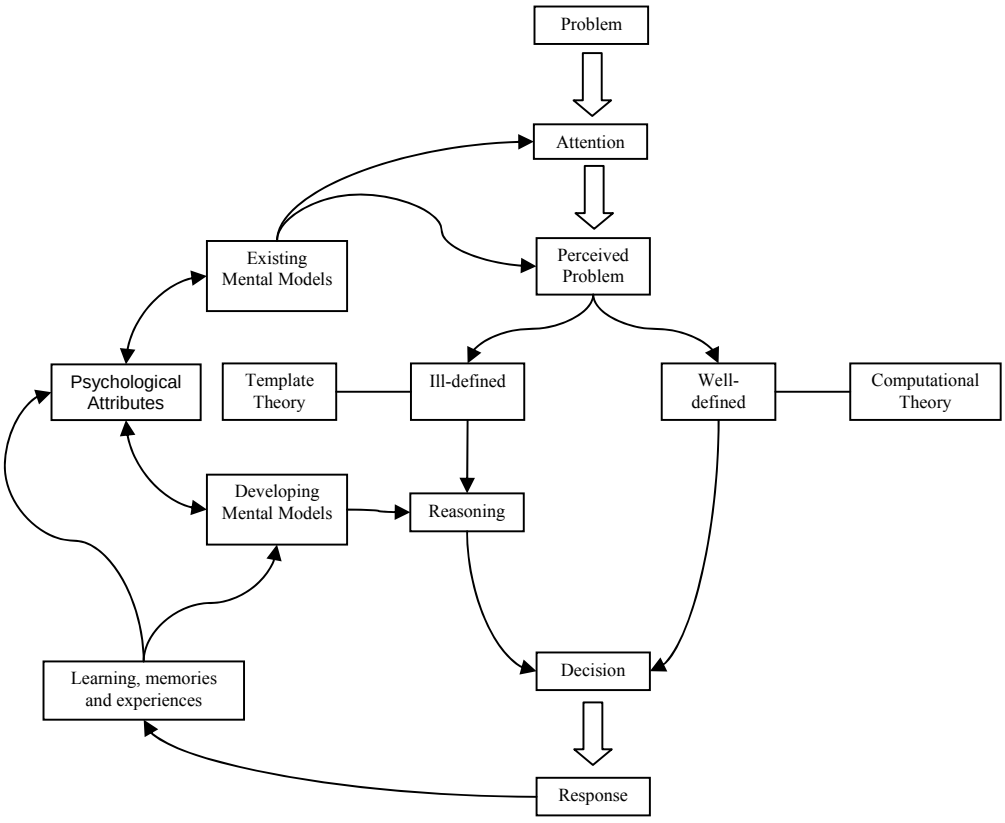


Figure 14: Influence of psychological attributes and mental models over decision making processes

The primary implication for theory made by this thesis is that psychological attributes have been found to directly and indirectly influence performance and decision making effectiveness in an organisational setting. This finding provides data that further reinforces the practical applicability of theories related to mental models, decision heuristics and bounded rationality. The significance and effect size of planning strategy also signifies the importance and power of the influence exerted by certain psychological attributes and mental models in the decision making process. These findings identify the strong association and relevance of cognitive and personality psychology theories in organisational contexts. Specific to this thesis is the applicability of these theories to New Zealand organisations, SME's and organisational financial performance.

There are also direct implications for organisational theory and behaviour literature. The findings of this research emphasise the impact that owner/operators can have over the financial performance of their organisation. In the case of this research the findings indicate the performance of organisations is noticeably influenced by the decision making ability of the owner/operator. The organisation is therefore, in reality, behaving more like the individual than a separate entity in its own right. Theories which address the application of various traditional management and organisational methods maybe somewhat void if the individual operating the organisation does not possess adequate psychological attributes. Also theories which identify the need for particular structures, procedures or policies to be in place in order for organisations to succeed could be brought into question. The findings of this research indicate that the psychological attributes of the owner/operator are one of the initial determinants of organisational performance. Past research that identifies structures, processes or policies common in high performing organisations, may moreover be identifying common behaviour of owner/operators sharing preferable psychological attributes. However, further comparative study is required before these assertions can be proven; as one could argue that effective structures and team processes are only put in place by individuals who possess preferable psychological attributes. As such measurement of either determinant would be valid when trying to isolate variables contributing to performance.

With specific reference to theory related to ambiguity tolerance (AT) my findings address a number of gaps in the literature. These gaps are identified in detail in chapter two section 2.1.7. To date there has been no research in the literature that has isolated AT as a dispositional trait in relation to organisational performance. This thesis has suggested that while no direct relationship exists between AT and organisational performance there is an indirect relationship. This relationship has also been found to exist across multiple industry types in this research, with past literature only focusing on general non-financial performance measures and on specific industry types. The implication for theory related to AT is that the trait may have a broader influence on organisational performance than identified in the literature at present. Another finding discussed in chapter four section 4.1.5 is the inadequacy of AT scale used in this thesis. Despite this scale being the most commonly accepted in the literature at present there is some need to develop a new scale with better reliability and less ambiguous items. The findings of this research also further support the positive associations found in different research settings between AT and self efficacy.

With respect to theory related to self efficacy (SE) my findings have a number of implications for the literature. The literature gaps related to SE are identified in chapter two section 2.2.8. This research is the first to investigate the influence of SE over financial performance in SME organisations. The conclusion that SE does act to indirectly influence performance through planning strategy has a number of implications to related theory. (1) It starts to uncover the potential relationship between SE and planning orientation. As stated in chapter two this relationship had received little attention in the literature to date. (2) The findings of this research suggest that SE is positively associated with planning strategy partially addressing this gap in the literature. (3) In respect to general performance this thesis broadens the research domains where SE has been found to in some way influence performance. (4) The findings of this research also further support the positive associations found in different research settings between SE and AT and resilience.

The findings of this thesis have a number of contributions to theory related to the concept of resilience (RES). The literature gaps related to RES are identified in chapter two section 2.3.7. The first major contribution to the literature is that this thesis investigates the contribution of RES to organisational performance during normal organisational operation. Past literature has only focused on the effects of employ RES over individual stress and shock during times of organisational change. These studies all largely concluded that higher levels of RES improved employee ability to cope with stress and change processes, this thesis has gone further to conclude that RES exerts some influence over an organisations financial success. The implication for theory is that increased RES not only improves the well-being of the individual of interest, but the performance of the organisation they are responsible for. The findings of this thesis have also found to be valid in an adult population with the majority of past literature focusing on RES in children. Finally a significant positive relationship between RES and AT has been demonstrated. As discussed in chapter two there have been few references to the relationship between these constructs in the literature. The qualitative limitations in this thesis' design limit any reliable conclusions regarding what underlies this relationship. Intuitively it is reasonable to make an inference that as an individuals' ability to tolerate unknown situations increases, so does their ability to deal with failure and the uncertainties associated with it. Likewise an individual, who demonstrates an ability to rebound from failure and learn from their mistakes, will not 'fear' or be intolerant of the unknown or ambiguous.

As identified in chapter two the development of the planning orientation (PO) concept in the literature is limited. There are few studies that have focused on the cognitive aspects of planning with most studies focusing on the absence or presence of planning, without considering how planning is formulated by the mental models and thought processes of the individual. The findings of this thesis therefore present a number of distinct contributions and have a number of implications for theory regarding planning in organisational settings. First the findings of this research have found that the strategic planning orientation of owner/operators of SME organisations has a significant effect over financial performance. This has a number of implications for the present

theory on planning in organisations; (1) planning must no longer be seen solely as a procedural process within individuals and teams, moreover planning is a cognitive process which is influenced by the mental models of the decision maker. Plans are therefore not only developed and influenced by the technical knowledge and experience in the organisation, but also by the cognitive processes of individuals involved in formulating the plan. (2) The relevant sub-elements of planning are significantly related and as such do not influence the planning process in isolation. Where studies to date have largely considered singular aspects of planning, this thesis demonstrates the need to consider a broad spectrum of planning sub-elements when attempting to determine the cognitive planning processes of an individual. (3) This thesis has helped to further establish the PO concept in the literature by offering a specific definition of the concept and broadening the domains where the concept has been applied. This has demonstrated that PO is a significant determinant in organisational performance and not limited to the past domains of cross cultural comparison studies. (4) The findings of this thesis have determined that planning orientation shares a significant positive association with the AT, SE and RES psychological attributes. At present this relationship is modeled as a two way relationship as it is likely that planning orientation and the psychological attributes influence each other in bi-directional fashion.

This thesis also makes modest contributions to the areas of human resource management training and selection theories and organisational entrepreneurship. The contributions related to human resource training and selection are more practical in orientation and are discussed in section 5.4. Theoretically this thesis provides another method of training individuals through consideration of cognitive planning processes and psychological attributes. While there are numerous tests available to assist in psychometric assessment, this thesis offers a new method of assessing and training individuals to develop complex problem solving and decision making skills. In respect to organisational entrepreneurship the findings of this thesis have reinforced the findings of a number of studies which have suggested that thought processes and decision making behaviours of senior organisational owner/operators, have a distinct impact over an organisations financial performance. While not specifically researched in this study the

findings may potentially indicate that preferable planning and psychometric attributes are important in ensuring the growth of new SME's. However as this study did not record the time the participant organisation has been in operation, this suggestion is not statistically supported.

5.3 Implications for practice

The findings of this thesis present a number of implications for practice. First the test utilised demonstrates promise for being developed into an effective selection, training or management tool. With refinement this tool could be suited for determining the psychological attributes possessed by an individual, and the manner in which these attributes may influence an organisations performance if the individual is placed in a position of decision making authority. This information will be able to assist in highlighting areas for possible training and improvement in an individual's planning and decision making ability, or to assist in selecting the most suitable applicant for a position. This type of testing is likely to become increasingly important in the present and future business environment, as businesses are becoming more dynamic and complex requiring staff to frequently adapt to new situations, problems and structures.

Second there are some benefits from a managerial perspective. An understanding of individual staff members' psychological attributes and planning tendencies may assist in developing effective management strategies to assist staff in complex situations. This knowledge may be useful in assisting with team selection processes to ensure a preferable mix of psychological attributes and planning characteristics are included in a team. Understanding an individual's ability to comprehend complexity and uncertainty could also potentially help managers to set the individual tasks in an appropriate manner. For example, if an individual has a singular strategic planning orientation then it is inappropriate to set them a task which requires them to consider multiple problems simultaneously without appropriate coaching and support.

The usage of this model alone as a selection tool must be cautioned, as the research only used the financial performance of the participants' organisation as a

measure of performance. As such other factors outside of the participants' psychological attributes will also have been acting on the performance measure. Preferable planning orientation will not necessarily lead to increased organisational financial performance, however this research does indicate general consistencies in the planning orientation and psychological attributes of successful SME owner operators. The findings of this research should only be applied to complement existing recruitment and training practices, and used more to determine the general planning and problem solving characteristics of potential candidates. If a manager is considering applying the findings of this research in an organisational setting for selection or training the researcher recommends consideration of the following.

1. Does the position require specific technical skills from the applicant?

2. Does the applicant have experience and the relevant qualifications required to practice the technical skills and duties required by the position?

3. Is the position of interest significantly responsible for the general strategic direction or operation of the organisation? This research only considered individuals who were the owner/operators of SME organisations. These individuals are likely to be solely responsible for the majority of their organisations decision making processes. The results only relate to financial performance of the organisation of interest. Therefore any use of this test must be focused on positions directly related to the financial success of the organisation. Providing that the applicant or employee meets the above criteria to a satisfactory level then the findings of this research can be applied. These technical skills are required beyond the generic psychological attributes tested in this research.

4. Test the psychological attributes of the individual. This will give a general indication of how suitable individuals' psychological attributes are for operating a business unit or organisation. Preference is towards an individual with an uncertain, proactive and simultaneous (parallel and multiple) planning strategy. It

is also considered desirable if they possess moderately high levels of planning complexity, specificity and depth along with high ambiguity tolerance, self efficacy and resilience.

5. Analyse the sub elements of the item scales related to ambiguity tolerance, self efficacy and resilience and pay particular attention to the planning orientation elements of the individual. These sub elements will provide an insight into the particular styles of planning utilised by the individual and various personality traits.

To increase the practical applications of the findings of this thesis more research is required in regards to the suitability of the model proposed by this study in different problem solving settings. For example do the positive strategic planning orientation traits improve performance in organisational tasks not related to the organisations general strategy or direction. Also before this model can be used effectively as a coaching tool for management there is also a need to investigate whether the preferable strategic planning orientations can be learned and developed; or are they inherent and imbedded within an individual.

5.4 Implications for future research

The findings of this thesis in combination with the limitations in the sample frame and methodology present a broad potential for future research. The first major limitation is defined by the sample frame of this thesis, small to medium sized New Zealand organisations. There is scope to broaden this sample frame to test in other jurisdictions, for example is there a difference between western and eastern style business owner/operators in respect to the psychological attributes of interest to this thesis. Initial research in a Thai context indicates that there is no difference between the groups, but due to the limited sample size collected during this research project, definitive conclusions could not be drawn. The sample frame could also be broadened to encompass different sized organisations, for example do the effects of planning orientation still exert the same influence in larger organisations where there may be

multiple hierarchies of decision making. There is also scope to broaden the dependent variables of interest. As stated in chapter one there are numerous ways to measure organisational success and growth beyond the financial measures adopted by this thesis. Some performance measures of interest could include staff or customer satisfaction, staff turnover, balanced scorecard measures, asset growth, debt to equity ratios and so on. Finally, the research frame could be changed to include not for profit, professional or government organisations that were excluded from this thesis.

The second area of opportunity for future research relates to the data collection methodology employed by this thesis. The use of a mail based questionnaire was required due to the quantitative research design of this thesis, however this design is limiting in that it does not provide an underlying understanding of the results. Therefore interpretation of the meaning of the results is largely left to the speculation of the thesis author. Future research could be directed towards interviewing individuals with different psychological attributes to understand how the attributes influence their decision making processes, whether these influences are conscious or not and begin to understand whether individuals can be trained to adopt preferable planning orientation characteristics.

The third area of future research opportunities relates to the psychological attributes investigated in this thesis. This thesis has opted to focus on the attributes of ambiguity tolerance, self efficacy and resilience. Yet there are over 60 other well established psychological attributes with established scales that may also be influencing organisational performance. There is also a need to research the influence of ambiguity tolerance using a more effective measurement scale, or even to develop a new scale for ambiguity tolerance. The development of item scale measures that accurately capture planning strategy without the need for planning scenario analysis could be a very useful contribution to the literature. This would improve the required assessment times and remove the need for human intervention and interpretation during the analysis process.

The final area for future research is to conduct longitudinal analysis on changes between psychological attributes and organisational performance over time. Possible

research topics could include: (1) does coaching owner/operators to improve their psychological attributes improve organisational performance over time? (2) What effect does a change in organisational performance have on the psychological attributes of owner/operators? (3) How do ambiguity tolerance, self efficacy and resilience act to moderate planning strategy and organisational performance over time?

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7.0 Appendix A: Survey Instrument

Survey of Attributes of Business Leaders and Managers

Note: *this letter should be seen by the owner-operator or CEO of the company*

Dear Sir/Madam

I am seeking respondents in a major study on New Zealand organisations. The purpose of this study is to gather data on the attributes of managers and businesspeople in New Zealand, to determine how these attributes contribute to business performance. The study is part of my doctoral thesis at the University of Canterbury. The Tertiary Education Commission is also supporting this research. The findings of the study will help in designing appropriate selection, educational and training activities to enhance managerial effectiveness and the performance of New Zealand businesses.

The University of Canterbury's Human Ethics Committee has approved this research. The data you provide will be kept ***strictly confidential*** and will not be disclosed to anyone. My thesis will only discuss aggregate statistical trends throughout the entire sample and will not mention specific individual responses. ***You can also request to have the information you have provided removed from the research sample at any subsequent date.*** This work is being carried out under the supervision of Dr. V. Nilakant, who is a Senior Lecturer at the University of Canterbury.

Should you have any concerns or questions about the study, please contact me on:

(03) 3642987 ext. 8983 or through e-mail at *m.walley@mang.canterbury.ac.nz*

I would like to thank you for supporting this research. I greatly appreciate your contribution to the work. It would be helpful if responses could be returned by July 15, 2005 in the post-paid envelope enclosed.

Sincerely,

Matthew Walley

1.0 Planning Strategy

Please explain in the space provided how you would respond to the following situation. State *any assumptions* and *decisions* made*, information required* and *steps* that would be applied to resolve this situation.

> *Imagine you are part of the management of a Christchurch textile company. Currently you are responsible for the restructuring of the company. Your workload is heavy. Demanding meetings are scheduled for the next few days. Tough decisions have to be made. A board meeting is planned for the end of the week and the directors expect tangible results from you. Tonight, shortly before you plan to leave, you receive a call telling you of unexpected problems in the Invercargill Branch. These problems fall into your area of responsibility and require your presence down south urgently. Your secretary has already booked the early morning flight for you.*

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1.1 AT-20 Scale

Please do not spend too much time on the following items. There are no right or wrong answers and therefore your first response is important. Circle ***T*** for **true** and ***F*** for **false**. Be sure to answer every question.

1.	A problem has little attraction for me if I don't think it has a solution.	T F
2.	I am just a little uncomfortable with people unless I feel that I can understand their behaviour.	T F
3.	There's a right way and a wrong way to do almost everything.	T F
4.	I would rather bet 1 to 6 on a long shot than 3 to 1 on a probable winner.	T F
5.	The way to understand complex problems is to be concerned with their larger aspects instead of breaking them into smaller pieces.	T F
6.	I get pretty anxious when I'm in a social situation over which I have no control.	T F
7.	Practically every problem has a solution.	T F
8.	It bothers me when I am unable to follow another person's train of thought.	T F
9.	I have always felt that there is a clear difference between right and wrong.	T F
10.	It bothers me when I don't know how other people react to me.	T F
11.	Nothing gets accomplished in this world unless you stick to some basic rules.	T F
12.	If I were a doctor, I would prefer the uncertainties of a psychiatrist to the clear and definite work of someone like a surgeon or x-ray specialist.	T F
13.	Vague and impressionistic pictures really have little appeal to me.	T F
14.	If I were a scientist, it would bother me that my work would never be completed (because science will always make new discoveries).	T F
15.	Before and examination, I feel much less anxious if I know how many questions there will be.	T F
16.	The best part of working a jigsaw puzzle is putting in the last piece.	T F

17. Sometimes I rather enjoy going against the rules and doing things I'm not supposed to do. T F

18. I don't like to work on a problem unless there is a possibility of coming out with a clear-cut and unambiguous answer. T F

19. I like to fool around with new ideas, even if they turn out later to be a total waste of time. T F

20. Perfect balance is the essence of all good composition. T F

1.2 NEO: N6

Please use the rating scale below to describe how accurately each statement describes ***you***. Describe yourself as you generally are now, not as you wish to be in the future.

Please rate your response between 1 (***strongly disagree***) and 7 (***strongly agree***).

1. I panic easily.

   Strongly disagree *1 2 3 4 5 6 7* ***strongly agree***

2. I become overwhelmed by events.

   Strongly disagree *1 2 3 4 5 6 7* ***strongly agree***

3. I remain calm under pressure.

   Strongly disagree *1 2 3 4 5 6 7* ***strongly agree***

4. I know how to cope.

   Strongly disagree *1 2 3 4 5 6 7* ***strongly agree***

5. I feel that I'm unable to deal with things.

   Strongly disagree *1 2 3 4 5 6 7* ***strongly agree***

6. I can handle complex problems.

   Strongly disagree *1 2 3 4 5 6 7* ***strongly agree***

7. I readily overcome setbacks.

   Strongly disagree *1 2 3 4 5 6 7* ***strongly agree***

8. I can't make up my mind.

   Strongly disagree *1 2 3 4 5 6 7* ***strongly agree***

9. I get overwhelmed by emotions.

   Strongly disagree *1 2 3 4 5 6 7* ***strongly agree***

10. I am calm even in tense situations.

Strongly disagree *1 2 3 4 5 6 7* ***strongly agree***

1.3 NEO: CI

Please use the rating scale below to describe how accurately each statement describes ***you***. Describe yourself as you generally are now, not as you wish to be in the future.

Please rate your response between 1 (***strongly disagree***) and 7 (***strongly agree***).

1. I complete tasks successfully.

Strongly disagree *1 2 3 4 5 6 7* ***strongly agree***

2. I excel in what I do.

Strongly disagree *1 2 3 4 5 6 7* ***strongly agree***

3. I misjudge situations.

Strongly disagree *1 2 3 4 5 6 7* ***strongly agree***

4. I don't understand things.

Strongly disagree *1 2 3 4 5 6 7* ***strongly agree***

5. I have little to contribute.

Strongly disagree *1 2 3 4 5 6 7* ***strongly agree***

6. I handle tasks smoothly.

Strongly disagree *1 2 3 4 5 6 7* ***strongly agree***

7. I am sure of my ground.

Strongly disagree *1 2 3 4 5 6 7* ***strongly agree***

8. I come up with good solutions.

Strongly disagree *1 2 3 4 5 6 7* ***strongly agree***

9. I don't see the consequences of things.

Strongly disagree *1 2 3 4 5 6 7* ***strongly agree***

10. I know how to get things done.

Strongly disagree *1 2 3 4 5 6 7* ***strongly agree***

1.5 Personal Information (Optional)

Name:

Gender (Circle one): Male Female

Number of Years in Business (Experience):

Number of Businesses Owned/managed:

Please indicate if you are available for further comment if required:

Yes	No

2.0 Company Performance

The following questions relate to your organisation. Please provide as accurate information as possible. I am primarily concerned with growth rates over the period 2000-2003. If you are unable to supply precise data, then growth percentages over this period would be greatly appreciated.

1. Please indicate your full time equivalent staff numbers for the following years:
   - 2000 _____
   - 2001 _____
   - 2002 _____
   - 2003 _____

2. Please indicate your organisation's sales revenue (to the nearest $100,000) for the following years:
   - 2000 _____
   - 2001 _____
   - 2002 _____
   - 2003 _____

3. Please indicate your organisation's profits (to the nearest $100,000) for the following years:
   - 2000 _____
   - 2001 _____
   - 2002 _____
   - 2003 _____